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ARCHEOLOGY
IN THE UPPER DELAWARE VALLEY

ANTHROPOLOGICAL
SERIES NO. 2

W. FRED KINSEY, III

Contributors: Herbert C. Kraft • Patricia Marchiando • David J. Werner

Anthropological Series of the Pennsylvania Historical and Museum Commission:

No. 1. Foundations of Pennsylvania Prehistory, edited by Barry C. Kent, Ira F. Smith, III, and Catherine McCann (1971). 615 pages, 154 illus., 22 tables (cloth) $10.00

No. 2. Archeology in the Upper Delaware Valley: A Study of the Cultural Chronology of the Tocks Island Reservoir, by W. Fred Kinsey, III, with contributions by Herbert Kraft, Patricia Marchiando, and David Werner (1972). 499 pages, 125 illus., 13 tables (cloth) $10.00

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ANTHROPOLOGICAL SERIES

NUMBER 2

ARCHEOLOGY IN THE UPPER DELAWARE VALLEY

A Study of the Cultural Chronology of the Tocks Island Reservoir

BY

W. FRED KINSEY, III

CONTRIBUTORS: HERBERT C. KRAFT,
PATRICIA MARCHIANDO, AND DAVID WERNER

— • —

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Contents

Lists of Illustrations and Tables v
Introduction xi

Herbert C. Kraft

The Miller Field Site, Warren County, New Jersey 1

David J. Werner

The Zimmermann Site, 36-Pi-14 55

Patricia Marchiando

Bell-Browning Site, 28-Sx-19 131

W. Fred Kinsey, III

Faucett Site, 36-Pi-13A 159
Brodhead-Heller Site, 36-Pi-7 (with Charles W. McNett, Jr.) 199
Egypt Mills Site, 36-Pi-12 225
Kutay Site, 36-Pi-25 239
Brodhead Site, 36-Pi-30 257
Camp Ministerium Site, 36-Mr-8 269
Lee's Terrace Site, 36-Pi-35 281
McCann Site I, 36-Pi-33 291
Peters-Albrecht Site, Lowest Terrace, 36-Pi-21 301
Peters-Albrecht Site, Second Lowest Terrace, 36-Pi-22 313
Camp Miller Site, 36-Mr-12 321
Summary 327

Appendix
  Lithic 399
  Pottery 451
Bibliography 477
Index 491

List of Illustrations

Frontispiece: Aerial View of the Upper Delaware Valley.
Fig. 1A. Locations of archeological sites xii
Fig. 1B. Locations of archeological sites xiv
Fig. 2. Pit profiles xxvi

Miller Field Site

Fig. 3. Excavated area 4
Fig. 4. Excavation in progress 6
Fig. 5. Distribution of features 9
Fig. 6. Late Archaic and Transitional period artifacts 13
Fig. 7. Transitional and Woodland period artifacts 15
Fig. 8. Transitional and Woodland period polished stone artifacts 18
Fig. 9. Transitional period artifacts 21
Fig. 10. Owasco and Intermediate Series pottery 44
Fig. 11. Incised Collar Series pottery 47
Fig. 12. Historic trade material 50
Fig. 13. Effigy faces 53

Zimmermann Site

Fig. 14. Key to excavation plans and profiles 57
Fig. 15. Excavated area 60
Fig. 16. Excavated area 64
Fig. 17. Excavated area 66
Fig. 18. Excavated area 68
Fig. 19. Excavated area 70
Fig. 20. General excavation scene 73
Fig. 21. Artifacts from level 4 74
Fig. 22. Artifacts from level 4 76
Fig. 23. Artifacts from level 3 77
Fig. 24. Artifacts from level 3 79
Fig. 25. Artifacts from level 3 81
Fig. 26. Soapstone vessels 82
Fig. 27. Artifacts from level 3 83
Fig. 28. Rim sherds from levels 2 and 1A 89
Fig. 29. Restored pottery vessels 91
Fig. 30. Artifacts from level 2 93
Fig. 31. Artifacts from level 2 95
Fig. 32. Rim sherds from levels 1A and 1 98
Fig. 33. Artifacts from levels 1A and 1 104
Fig. 34. Artifacts from levels 1A and 1 106
Fig. 35. Rim sherds and a restored vessel from levels 1A and 1 109
Fig. 36. Munsee Incised 110
Fig. 37. Late Woodland rim sherds 112
Fig. 38. Late Woodland rim sherds 113
Fig. 39. Clay pipes 115

Bell-Browning Site

Fig. 40. Excavated area 136
Fig. 41. Native and European artifacts 139
Fig. 42. Native and European artifacts 142
Fig. 43. Owasco and Tribal Series pottery 150
Fig. 44. Owasco and Tribal Series pottery 152
Fig. 45. Restored vessels and bucket 155

Faucett Site

Fig. 46. Stratigraphic profile 160
Fig. 47. Excavated area 162
Fig. 48. Early Series pottery 165
Fig. 49. Owasco and Tribal Series pottery 167
Fig. 50. Intermediate Series pottery 168
Fig. 51. Seriation of Early Series pottery 169
Fig. 52. Triangular points and notched and trimmed implements 173
Fig. 53. Projectile points 174
Fig. 54. Seriation of projectile point types 177
Fig. 55. Adzes 180
Fig. 56. Artifacts of the Bushkill complex 183
Fig. 57. Artifacts of the Bushkill and Late Woodland components 184
Fig. 58. Miscellaneous Late Woodland artifacts 186
Fig. 59. Excavation scene 189
Fig. 60. Orient hearth 190

Brodhead-Heller Site

Fig. 61. Stratigraphic profile 200
Fig. 62. Stratigraphic profile 202
Fig. 63. Projectile points 208
Fig. 64. Ground stone artifacts 214
Fig. 65. Orient hearth 221
Fig. 66. Excavation scene 223

Egypt Mills Site

Fig. 67. Aerial view 224
Fig. 68. Excavated area 226
Fig. 69. Projectile points 229
Fig. 70. Seriation of projectile points 230
Fig. 71. Ground stone artifacts 232

Kutay Site

Fig. 72. Excavated area 238
Fig. 73. Tribal pottery 242
Fig. 74. Restored vessels from Kutay and other sites 244

Fig. 75. Shell openers . . . 247
Fig. 76. Excavation scene . . . 249
Fig. 77. Pit, Feature 60 . . . 251

Brodhead Site

Fig. 78. Aerial view . . . 258
Fig. 79. North excavation . . . 260
Fig. 80. South excavation . . . 262
Fig. 81. Brodhead Net-Marked pottery . . . 263
Fig. 82. Reconstructed Brodhead Net-Marked vessel . . . 265

Camp Ministerium Site

Fig. 83. Aerial view . . . 268
Fig. 84. Excavated area . . . 270
Fig. 85. Owasco and Tribal Series pottery from Camp Ministerium and other sites . . . 272
Fig. 86. Excavation scene . . . 275
Fig. 87. Collecting soil samples . . . 276

Lee's Terrace Site

Fig. 88. Aerial view . . . 280
Fig. 89. Excavated area . . . 282
Fig. 90. Pit, Feature 1 . . . 285
Fig. 91. Projectile points from Lee's Terrace and other sites . . . 286

McCann Site I

Fig. 92. Aerial view . . . 290
Fig. 93. North excavated area . . . 292
Fig. 94. South excavated area . . . 294

Peters-Albrecht (36-Pi-21) Site

Fig. 95. Excavated area . . . 303
Fig. 96. Projectile points from Peters-Albrecht (21) and other sites . . . 304
Fig. 97. Miscellaneous artifacts from various sites . . . 308
Fig. 98. Orient/Dry Brook hearth . . . 310

Peters-Albrecht (36-Pi-22) Site

Fig. 99. Excavated area . . . 314
Fig. 100. Exacavation scene . . . 319

Camp Miller Site

Fig. 101. Excavated area . . . 322
Fig. 102. Food drying rack . . . 324

Summary

Fig. 103. Artifacts of the Delaware Valley Archaic complex 333
Fig. 104. Laurentian-Brewerton artifacts 338
Fig. 105. Artifacts of the broadspear tradition 344
Fig. 106. Artifacts of the fishtail tradition 356
Fig. 107. Map of broadspear and fishtail components 359
Fig. 108. Artifacts of the Bushkill complex 365
Fig. 109. Owasco and Intermediate ceramic trends 378
Fig. 110. Vessel of the Sackett Corded type 379
Fig. 111. Tribal ceramic trends 381
Fig. 112. Seriation of Late Woodland pottery 383
Fig. 113. Owasco and Tribal artifacts 386

Appendix

Fig. 114. Projectile point terminology 400
Fig. 115. Laurentian-Brewerton projectile points 403
Fig. 116. Projectile points of the Delaware Valley Archaic complex 409
Fig. 117. Projectile points of the Northern Piedmont tradition 412
Fig. 118. Broadspear and other broadblade projectile points 424
Fig. 119. Broadspear and fishtail projectile points 428
Fig. 120. Early and Middle Woodland projectile points 434
Fig. 121. Miscellaneous projectile point types 440
Fig. 122. Platform pipe 450
Fig. 123. Pottery terminology 452

LIST OF TABLES

Zimmermann Site

Table 1. Burial data 62
Table 2. Pit associations 99

Bell-Browning Site

Table 3. Hand-hewn nails 143
Table 4. Eighteenth- and nineteenth-century ceramics 144
Table 5. Distribution projectile point types 145

Faucett Site

Table 6. Rock-lined hearths 163
Table 7. Lithic preference by levels 179

Egypt Mills Site

Table 8. Lithic preference by levels 234

Kutay Site

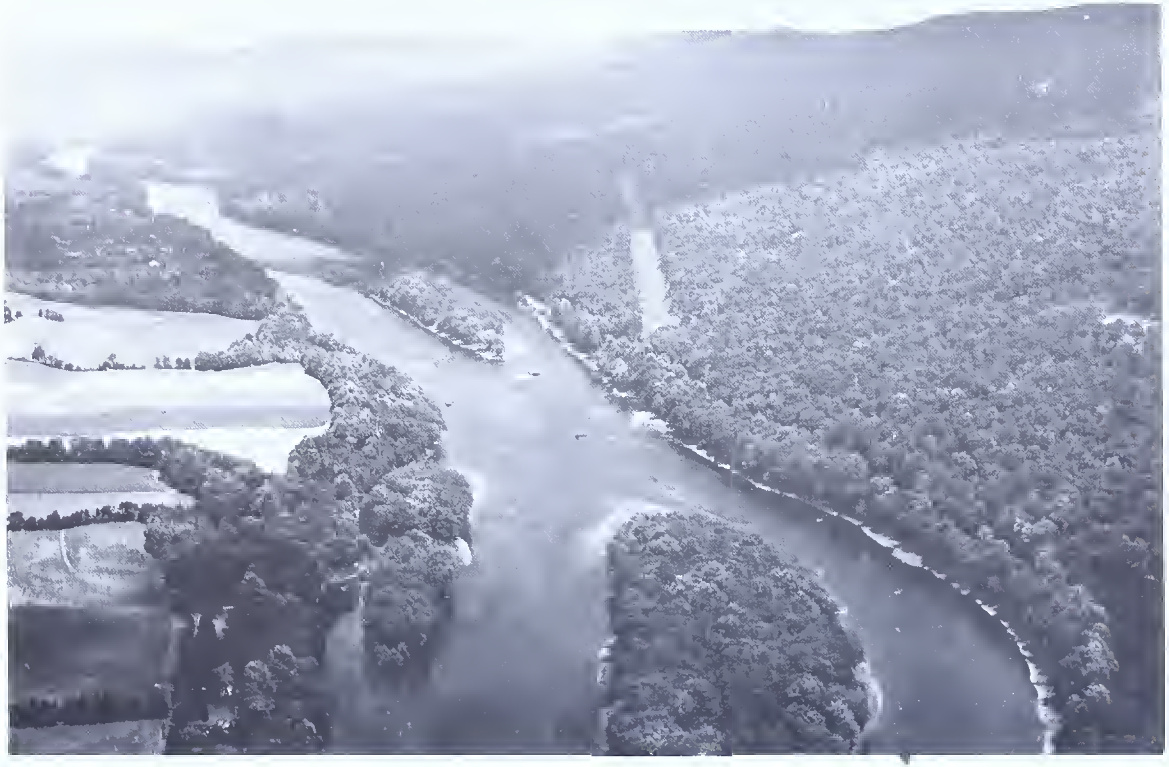
Table 9. Mollusk shell data 249

Summary

Table 10. Comparison of broadspear and fishtail traits 350
Table 11. Comparison of Bushkill and Lagoon traits 370
Table 12. Comparison of culture sequence and chronology ... 394

Appendix

Table 13. Frequency of projectile point types 446



Aerial view of the Upper Delaware Valley and Tocks Island.

Introduction

AREA

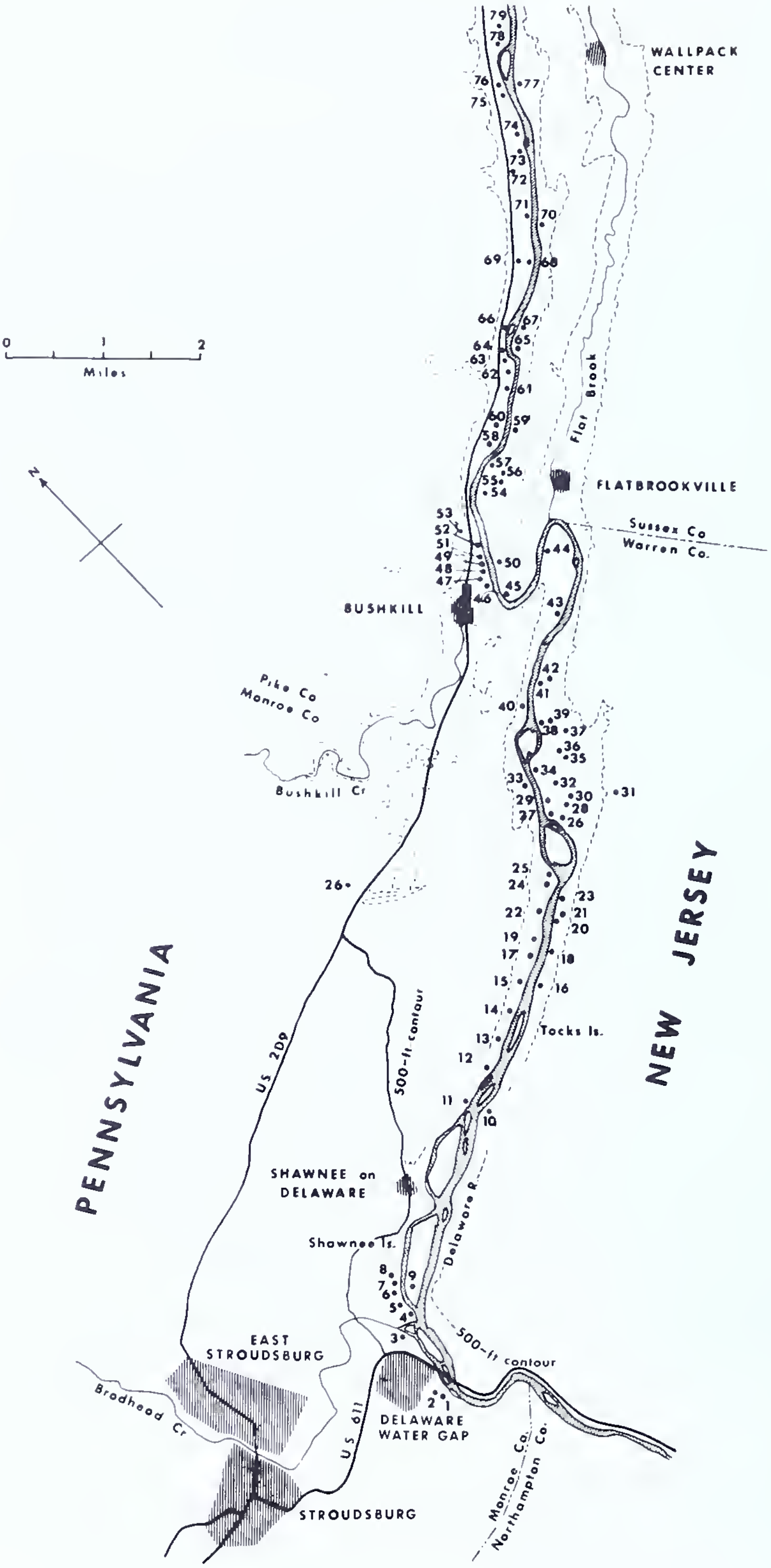
THE AREA under consideration extends for about 37 miles from the Delaware Water Gap to Port Jervis, New York. For reasons of geography and convenience this is referred to as the Upper Delaware Valley, although it is recognized that the area between Port Jervis and Hancock, New York, is more appropriately the Upper Delaware. However, if the Delaware Valley is equally divided between north and south, then the section from the Delaware Water Gap to Port Jervis is part of the northern valley and hence the use of the term Upper Delaware Valley.

Except for the several sites on the high bluff at Bell-Browning-Philhower, all other excavated sites are located on the flood plain, and only five of the 108 sites surveyed are located above the 500-foot contour, which is 72 feet above the projected level of reservoir waters. In Pennsylvania the area embraces Monroe and Pike counties and in New Jersey it includes Warren and Sussex counties. These are sparsely populated counties and most of the land is forested. Modest-size dairy and general farms are scattered along the bottomland, and there are a number of small towns and villages but no large population centers. Tourism is an important source of income throughout the valley.

GEOLOGY

The geology of this area is poorly known. The present landscape was modified in late Pleistocene times by glacial melt-water originating in the Hudson River provinces. One channel reached the Delaware River at Port Jervis while others flowed into the Delaware below the Water Gap. Above Port Jervis the Delaware River is a normal mountain stream, while below this point it is a melt-water stream. The gravels and other glacial sediments along the Delaware waterway for the most part came into it via these delta channels from the Hudson (Olafson: personal correspondence, June 3, 1964).

Physiographically the Upper Delaware system is part of the middle section of the Ridge and Valley Province of the Appalachian Highlands (Braun 1967: 492-3). As the river passes the tri-state area it turns to the southwest and flows into a broad fertile valley. To the east the valley is bounded by the Kittatinny Mountains, composed of Silurian sandstone, and on the west by a steeply rising escarpment of


WALLPACK CENTER
0
1
2
Miles
N
FLATBROOKVILLE
Flat Brook
Sussex Co
Warren Co.
BUSHKILL
Pike Co
Monroe Co
Bushkill Cr
NEW JERSEY
PENNSYLVANIA
Tocks Is.
US 209
500-ft contour
SHAWNEE on DELAWARE
Shawnee Is.
Delaware R.
EAST STROUDSBURG
Brodhead Cr
US 611
DELAWARE WATER GAP
500-ft contour
STROUDSBURG
Monroe Co.
Northampton Co.
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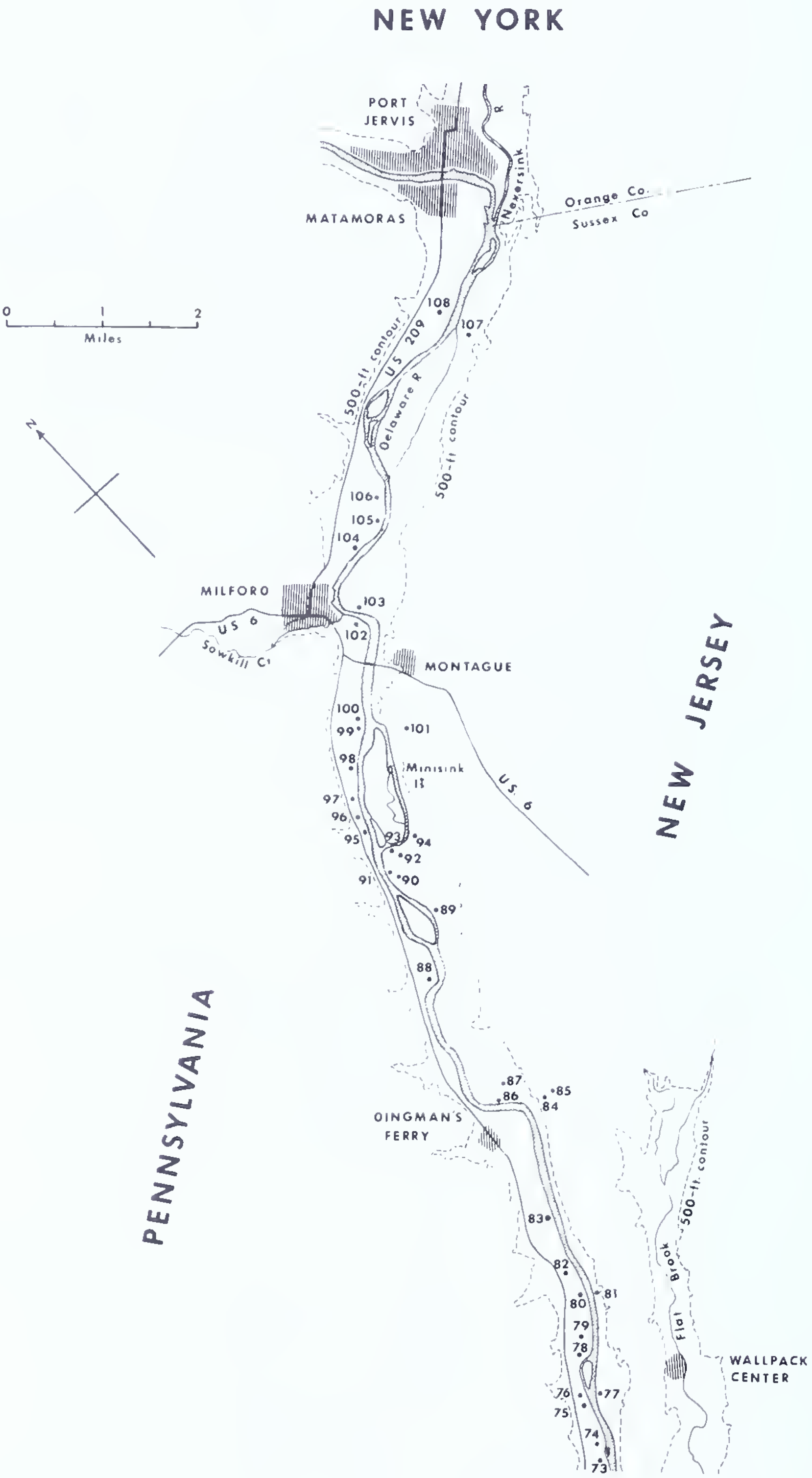
Devonian shales. The width of the flood plain varies from about 400 feet at the Water Gap to about 3,200 feet in the Milford area. River terraces are present and consist of glacial gravels overlaid by deep alluvial soils. At the Pike and Monroe county line the river makes a sharp hook to the east after which it turns to the southwest. In this section the valley lies in Silurian shales and limestones until it passes through the Kittatinny Mountains at the Water Gap and emerges into the Great Valley section. The area in Pennsylvania is dominated by Chemung, Genesee, Hamilton, and Marcellus Devonian shales. In New Jersey the dominant formations are the Helderberg Limestone and Oriskany Sandstone of the Catskill and Hamilton Group of the Devonian period and the Clinton red shales of the Silurian period (Gray 1960).

SOIL

The soil is deep in the alluvial flood plain, and except for the occurrence of numerous narrow reddish-brown bands, it is fairly homogeneous. These bands were found widely distributed throughout the valley in the soil profiles of almost all of the sites in New Jersey and Pennsylvania where deep testing took place. In order to explain the phenomenon of the reddish-brown bands, the services of William D. Sevon, Bureau of Topographic and Geologic Survey, Commonwealth of Pennsylvania, were secured. His report based upon findings at the Kutay and Brodhead-Heller sites follows:

←

Fig. 1A. LOCATIONS OF KNOWN ARCHEOLOGICAL SITES in the Upper Delaware Valley: 1, Boro; 2, Lake Lenape; 3, Price; 4, Ten Owners; 5, Big Brother II; 6, Big Brother I; 7, Silverwater-Eilenberger; 8, Workshop; 9, Shawnee Island; 10, Van Campen Home; 11, Newcomb; 12, Walter; 13, Kautz; 14, Kober; 15, Pardee Place; 16, Harry's Farm; 17, Camp Miller; 18, Van Campen's Cottage; 19, Theune; 20, Von Hagen Lower Field; 21, Von Hagen; 22, Michaels, Edith; 23, Pahaquarra Boy Scout; 24, Michaels I; 25, Michaels II; 26, Boehme I; 27, Boehme II; 28, Scherf South Field; 29, Scherf River Field; 30, Scherf North Field; 31, Zipser Lower Field; 32, Zipser Upper Field; 33, Camp Ministerium; 34, Miller River Field; 35, Miller Upper Field; 36, St. Christopher's; 37, Blasi; 38, Van Campen River Field; 39, Hamilton North Field; 40, Camp Hagen; 41, Hankin South Field; 42, Hankin North Field; 43, Gottier; 44, Hogback; 45, Peters; 46, Peters-Albrecht (21); 47, Peters-Albrecht (22); 48, Beck I; 49, Beck II; 50, Rosenkrans; 51, Zimmermann, Wilbur; 52, Brodhead; 53, Macpherson; 54, Medwin River Field; 55, Medwin South Field; 56, Medwin North Field; 57, Medwin; 58, Kutay; 59, Knight; 60, Faucett; 61, Faucett North Field; 62, Egypt Mills (south of Tom's Creek); 63, Egypt Mills First Field; 64, Egypt Mills Second and Third Fields; 65, Wachenfeld; 66, Egypt Mills Fourth Field; 67, McBride South Field; 68, Eshback Lower Field; 69, Eshback (near house); 70, McBride; 71, Brodhead-Heller; 72, Browning and Pharo I and II; 73, Lee's Terrace; 74, Eshback (sand pit); 75, McCann I; 76, McCann II; 77, Beisler Upper South Field; 78, Browning and Pharo; 79, Hill.


NEW YORK
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Neversink
Orange Co.
Sussex Co
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Miles
N
108
107
500-ft contour
US 209
Delaware R
500-ft contour
106
105
104
MILFORD
US 6
Sowkill Cr
103
102
MONTAGUE
NEW JERSEY
100
99
101
98
Minisink Is
US 6
97
96
95
93
94
92
91
90
89
88
PENNSYLVANIA
87
86
85
84
DINGMAN'S FERRY
83
500-ft contour
Flat Brook
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WALLPACK CENTER
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About 10 feet of alluvial sediment exposed in a deep test pit appeared lithologically uniform throughout except for the occurrence of numerous reddish-brown bands. The reddish-brown bands are generally parallel to the floodplain surface, but some of the bands have crest-like and trough-like irregularities and some separated bands join laterally. The bands are variable in thickness, ranging from ½ to 6 inches or more, with bands less than 2 inches thick being most common. The upper boundary of individual bands is sharply defined while the lower boundary is somewhat diffuse. The reddish-brown bands are noticeably less friable, both when moist and when dry, than the lighter colored sediment, and in the outcrop appear to have a higher clay content. At the Brodhead-Heller site, several occupational levels occur intermixed with the reddish-brown bands but there appears to be no relationship between the red bands and the occupation levels.

Two soil samples, one from a reddish-brown band and one from the overlying lighter-colored sediment, were collected from a deep test pit at the Kutay site, square N130E40. Binocular microscopic examination of the two collected samples indicates that they are virtually the same in every respect except quantity of iron oxide material. Both contain a mixture of about equal proportions of silt and fine- to very fine-grained sand. The material is mainly angular quartz grains with only a few heavy minerals such as epidote and hematite. The difference between the samples is the quantity of iron oxide material. This iron oxide material presumably occurs as coating on clay minerals, but may also be partially freely disseminated iron oxide. Approximately 5 times as much iron oxide occurs in the reddish-brown bands as occurs in the lighter colored sediment.

The presence of over 4 feet of sediment above the lowest occupation level and the occurrence of several other occupation levels between it and the upper floodplain surface, at the nearby and similarly situated Brodhead-Heller site, indicates that floodplain sedimentation has occurred since the

←

Fig. 1B. LOCATION OF KNOWN ARCHEOLOGICAL SITES in the Upper Delaware Valley: 73, Lee's Terrace; 74, Eshback (sand pit); 75, McCann I; 76, McCann II; 77, Beisler Upper South Field; 78, Browning and Pharo; 79, Hill; 80, Browning and Pharo (lower Brumbaugh); 81, Sandmeyer; 82, Lillie (upper Braumbaugh farm); 83, Schneider; 84, Friedman Knoll; 85, Friedman II; 86, Hartwick; 87, Friedman I; 88, Zimmermann, Marie; 89, Hull; 90, Herring #1; 91, Herring #2; 92, Bell-Browning Post; 93, Bell-Philhower; 94, Bell-Browning; 95, McCarty; 96, Manna; 97, Ludwig; 98, Medwin, Clower; 99, Medwin, Abraham; 100, Wolf; 101, Brace; 102, Metz; 103, Davenport; 104, Santos; 105, Cuddeback; 106, Maxaner; 107, Zierdt; 108, Kokolias.

earliest known occupation of that site. The uniformity of the sediment, the lack of any recognizable discontinuities and the fineness of the sediment suggest that the sediment deposition has always occurred under similar conditions and always as overbank deposition well removed from the main river channel.

The reddish-brown bands are best explained as a result of leaching of the lighter-colored zones (A horizon) and concentration of iron oxide and iron oxide-coated clay minerals in the reddish-brown zones (B horizon) by a process of podzolization. The repetitive sequence could result from the following mechanism:

a. Sediment containing a mixture of clay, silt and sand is deposited on the floodplain. The clay may or may not be iron oxide-coated.
b. Downward moving water leaches the clay from the upper part of the sediment (A horizon) and concentration is initiated at a level (B horizon) which is probably related to a zone of interaction between downward moving (gravitational) and upward moving (capillary) waters. Some free iron oxide migration and concentration may result if the waters are sufficiently acid.
c. Concentration of clay and iron oxide will continue at this same level until a sufficient thickness of sediment has been deposited on the floodplain to cause a change in the equilibrium conditions which cause B horizon development. Such a change is most likely to occur following a large flood which deposits several inches of sediment.
d. Following the change in condition a new and higher B horizon would begin to develop.

In summary, the numerous red bands occurring in alluvium along the Upper Delaware River, Pike County, Pennsylvania, result from concentration of iron oxides and iron oxide-coated clay minerals leached from overlying alluvium (A horizon) by a podzolization process. Continuing deposition of sediment upon the flood plain caused reoccurring changes in the position of the iron oxide accumulation zone (B horizon). [It is also noted that these reddish-brown bands do not require a long time span to form and they do not represent a period of great antiquity—Kinsey's note.]

Ecology

The Upper Delaware Valley is part of the northern uplands of the large temperate deciduous forest biome. It is an ecotome or transitional community between the maple-beech-hemlock region and the oak-chestnut region. The former is predominant in the northern edge of the deciduous forest and extends southward to the Appalachians, while the latter occurs from Cape Ann, Massachusetts, through the Mohawk Valley in New York to the southern end of the Appalachian Highland (Shelford 1963: 17-9). Since settlement and urbanization, the virgin forest has almost been destroyed. Present forest trees include, oak, hemlock, white pine, pitch pine, red maple, red oak, basswood, white ash, and others. Within the Delaware Water Gap National Recreation Area, 75 per cent of the land is forested (National Park Service 1966: 4). Rainfall is not seasonal and ranges from 28 to 60 inches annually.

The dominant animals are the white-tailed deer, wild turkey, and black bear. Other animals include porcupine, snowshoe hare, cottontail rabbit (two species), beaver, woodchuck, chipmunk, gray and red squirrels, oppossum, raccoon, and muskrat, among others. Over 250 species of birds may be present at various times; 46 species of fish, 10 or possibly 12 species of turtles, 15 species of snakes, and 25 species of amphibians can be found in the reservoir area (Staff 1966: 5).

POLLEN ANALYSIS (FIG. 87)

Arthur W. Shively, biology department, Franklin and Marshall College, collected and analyzed pollen from Peters-Albrecht (36-Pi-21 and 22), Brodhead-Heller, and Kutay sites in an attempt to determine something about the nature of the prehistoric flora. The results are inconclusive and they agree with Faegri's and Iversen's (1964: 157) contention that pollen from archeological deposits is not suited for accurate analysis. Shively reports:

> Because of the danger from contamination the results rendered here are highly questionable. Very few genera are represented and those that are present are represented by an extremely small number of pollen grains. Apparently the alluvial deposits have been so thoroughly sorted that the pollen has been lost.
>
> The most notable as well as the most disturbing feature of the deposits is the total absence of conifer pollen. The absence of grass pollen is not as surprising since grasses were not plentiful in the virgin forest.
>
> Among the pollens tentatively identified were: *Cornus* (dogwood family), *Arum* (arum family), *Polygonum* (Buckwheat family), some members of the *Malva* (malloy family), *Juncus* (rush family), *Betula* (birch) and/or *Alnus* (hazel), and *Acer* (maple). None of the samples studied totaled more than a few dozen pollen grains.

A Review of Archeological Investigations

A fairly substantial amount of archeological research has been conducted in this region. The earliest known work was begun in 1899 by Maxwell Somerville, University of Pennsylvania, at the Bell-Philhower site, Sussex County, New Jersey. This high wooded bluff, the nearby fields, and Minisink Island have been intensively explored. George Heye and George Pepper (1915) dug at the Bell-Philhower site, as did Ritchie (1949), and each summer from about 1922 until the 1940's the late Charles A. Philhower conducted extensive excavations on his property. In more recent years (1967-1968) the adjacent Bell-Browning site was excavated by Marchiando, while members of the Lenape Chapter, Society for Pennsylvania Archaeology, have also searched the area, and similarly members of the Sussex County Historical Society have been exploring in the vicinity.

Between 1915 and 1930 Max Schrabisch investigated the general area. He reported on a survey of Indian inhabitations in Sussex County, New Jersey (Schrabisch 1915), and he described a survey and the excavation of a number of sites between Hancock, New York, and Dingmans Ferry, Pennsylvania, and nearby areas (1930). Most of these sites are small rock shelters which yielded limited cultural remains. Schrabisch (1917) conducted investigations in Warren and Hunterdon counties, New Jersey, to an area south of the Delaware Water Gap. Schrabisch and Skinner (1913; 1917) also reported on their findings from a number of sites in the Delaware Valley.

The most diligent researcher and most prolific writer on the local area is Vernon Leslie, Honesdale, Pennsylvania. His early broad-based survey is a reconnaissance of archeological sites between Point Mountain, New York, and Bushkill, Pennsylvania (1946-1947). More recent articles deal with a projectile point typology for Wayne and Sullivan counties (1963c), the Paleo-Indian and the Archaic (1963b), the Transitional period (1965a), the Pebble industry (1965c), and a report on the Davenport site (1968b). Leslie has also produced two articles on local petrology (1964; 1965b) as well as a series of position papers and a variety of shorter single subject reports on pebble tools, projectile points, and other matters. (Refer to the Bibliography for a fuller listing.)

In the late 1930's and early in 1940, Dorothy Cross recorded a number of sites and excavated the Bevans and Moodys rock shelter, Sussex County (1941: 3, 253-4). Edmund Carpenter (1950) reported on Lewis M. Haggerty's several excavations of the 1940's at the Rosenkran's Ferry site, Sussex County, and the affiliation of this site to the Middlesex focus. More recently Ritchie and Dragoo (1960: 28) noted that a high percentage of the traits present at the Rosenkrans (also spelled Rosencrans) site are similar to traits found in Adena.

David J. Werner and other members of the Lenape Chapter of the Society for Pennsylvania Archaeology have conducted various excavations in the Milford area including the Zierdt, Schneider, and Herring No. 1 sites, as well as the extensive excavation of the Zimmermann site from 1960 to 1965 and the Manna site 1959 to 1960. The Forks of the Delaware Chapter of the Society for Pennsylvania Archaeology have surveyed and made tests on sites in the southernmost portion of the valley between the Delaware Water Gap and Bushkill, Pennsylvania.

Since the beginning of the archeological investigations under National Park Service contract, there have been a number of preliminary progress reports and short articles. Two reports on the activities of the New Jersey State Museum were given by Charles Ward at the Eastern States Archeological Federation meetings (1960: 15-6; 1961a: 13) and by Willard Sloshberg (1963: 13; 1964: 10-1). Ward described a survey and the excavation of two sites in New Jersey between Tocks Island and Dingmans Ferry, while Sloshberg reported on the work at the Pahaquarra Boy Scout Camp site. A symposium on the work accomplished during the summer of 1965 was held at the annual meeting of the Eastern States Archeological Federation, and it included papers by Hall, Kent, Kinsey, Kraft, and Marchiando (1966: 15-6). Some other short reports are Kinsey (1968, 1969), Kinsey and Kent (1965), Kraft (1965, 1966, 1968-70), and McNett (1967).

Tocks Island Reservoir

Many authorized federal multipurpose river basin projects are in progress or under study by the United States Army Corps of Engineers. In Pennsylvania and in adjacent states these include the lock reduction program to speed commercial water traffic on the Allegheny and Ohio rivers; flood control dams and reservoirs for the Delaware River, the Raystown Branch of the Juniata River, the upper Allegheny River, and the Cowanesque River; many small projects in the Ohio River drainage; and numerous others elsewhere. The proposed Tocks Island Reservoir is the largest and most important of the authorized multipurpose river basin projects in the Northeast.

The Delaware Water Gap National Recreation Area is organized within the Tocks Island Reservoir, and this project and others require the conservation of archeological and historical sites and the salvage of information from sites within its boundaries which are threatened with destruction, either by the reservoir waters or by the construction of roads or park facilities.

The National Park Service of the Department of the Interior has been given the responsibility to determine the recreational potential of the Tocks Island Reservoir area and to begin planning for its utilization. The National Park Service also has the responsibility of locating and determining the significance of archeological sites in areas affected by Federal construction. United States Congressional Act of August 21, 1935, declares that "it is a national policy to preserve for public use historic sites, buildings, and objects of national significance for the inspiration and benefit of the United States . . ."

Over the last 12 years many contracts between the National Park Service and various institutions have been in force each year for the execution of site surveys and salvage in the river basins, as part of the reservoir projects of the United States Army Corps of Engineers in the Northeast. The National Park Service has contracted with the New Jersey State Museum, Trenton; Seton Hall University, South Orange, New Jersey; Franklin and Marshall College, Lancaster, Pennsylvania; and more recently Queens College, City University of New York.

Contracts between the National Park Service and the New Jersey State Museum have been in effect since 1959. The report on the Bell-Browning site by Marchiando was carried out during 1967 and 1968 under contracts No. 14-10-5-950-2 and 14-10-5-950-17. The archeological investigations of the Miller Field site described by Kraft were also done in 1967 and 1968 under contracts No. 14-10-5-950-10, 14-10-5-950-29, and P.O. 950-316. Kinsey's work was done from 1964 to 1968 with the following eight contracts and purchase orders: Nos. 29-400, 14-10-5-950-3, 14-10-5-950-12, 14-10-0529-2860, 14-10-0529-2876, 950-37, 950-345, and NERO-841. The first of these contracts, 1964, called for a survey of archeological sites threatened with destruction. Eleven sites were located and tested in Monroe County and 38 sites in Pike County and a preliminary report was issued (Kinsey and Kent 1965).

ACKNOWLEDGMENTS

The three contracting institutions and responsible individuals, New Jersey State Museum, Patricia Marchiando; Seton Hall University, Herbert C. Kraft; and Franklin and Marshall College, W. Fred Kinsey, III, acknowledge their gratitude to John L. Cotter, National Park Service, chief, archeological research for the northeastern United States, for arranging the contractual agreements, for handling the numerous concomitant reports and details, and for his continuing interest and support of this work.

I wish to thank those individuals whose contributions of time and energy did much to make the archeological investigations of the Miller Field site a success. A debt of gratitude is owed to Lewis Dumont, Joan E. Kraft, Elizabeth Kraus, F. Dayton Staats, and Gary Van Winkle, and also to Seton Hall University for providing the necessary institutional support.

Herbert C. Kraft

The Zimmermann site report is the culmination of six years of work by Lenape Chapter 12, Society for Pennsylvania Archaeology, and I would like to express my appreciation to the many people who have contributed to this effort and who helped to make it possible.

The Lenape Chapter is especially indebted to Miss Marie Zimmermann, Milford, Pennsylvania, for permission to excavate on her property and also to her employes, Irving Smith, Charles Dotey, and Nelson Jagger, for their time and effort in moving soil from the path of our expanding excavations.

I am indebted to W. Fred Kinsey, III, for securing radiocarbon dates on two of the samples and for his guidance in the preparation of this report, and to William A. Ritchie, New York State Archeologist, who offered helpful suggestions after examining part of the assemblage from the site. I would like to thank Davis M. Lapham, chief mineralogist, Bureau of Topographic and Geologic Survey, Commonwealth of Pennsylvania, for his report on mineral samples and John E. Guilday, associate curator, Section of Vertebrate Fossils, Carnegie Museum, for his identification of animal remains. The assistance on several weekends by two visitors, Herbert C. Kraft and Ben Olsovsky of the Forks of the Delaware Chapter, Society for Pennsylvania Archaeology, is gratefully acknowledged.

I wish to express my gratitude to all members of Lenape Chapter

No. 12, both present and past, who participated in the excavation for their enthusiastic cooperation and endless patience. They have made this report possible: Fred Assmus, Josephine Bartley, William DeGraw, William Liser, William Lose, Arthur Frank Loux, Betty Polley, Edith Vandermark, Harold Vandermark, and Lyman Vandermark.

Special credit is due Fred Assmus, William DeGraw, and William Liser, who worked with the author from 1962 to 1967 and provided additional assistance. I am also particularly indebted to Arthur Frank Loux for his photographic reproductions used in the article and for his assistance from 1964 to 1967.

David J. Werner

The New Jersey State Museum has conducted archeological investigations in the Upper Delaware Valley since 1959. This program of site survey, testing, and excavation has been sponsored by the National Park Service, Department of the Interior; the New Jersey State Museum, Department of Education; and the Archeological Society of New Jersey.

Among the many individuals who contributed time, advice, and support of the Bell-Browning site report I should like to thank Kenneth W. Prescott, director, New Jersey State Museum. Special thanks are due Mr. and Mrs. Colin Browning, Port Jervis, New York, for granting us permission to excavate on their property and for extending themselves in many ways; to all property owners in the Tocks Island area who have been cooperative in allowing us to search their fields; and to the amateur archeologists who have shared with us their knowledge of the area. John M. Campbell, University of New Mexico, and Herbert L. Alexander, Bryn Mawr College, read the manuscript and were most helpful in making editorial corrections and suggestions. To my crew chief, Jeanne Schutt, and to all members of the field crew I owe thanks for their careful execution of duties. I am also indebted to the Museum laboratory assistants, Mrs. Philip Caesar, Mrs. Eugene Wilson, and Mrs. Edward Falcey, for helping in the preparation of the artifacts for analysis and for typing the manuscript; to James Mitchell, assistant curator of Americana, for making a number of identifications; and to Stephen J. Toth, Rutgers, The State University, for the analysis of soil samples from the site.

Patricia Marchiando

An acknowledgment of thanks is due many individuals and institutions for making this work possible. I am especially grateful to Franklin and Marshall College for administering the various contracts with the National Park Service, for an atmosphere conducive to study and research, for financial support in the form of four Institutional National Science Foundation Faculty Research Grants, and for providing funds for work-award students. Other assistance came from the National Science Foundation, Grant E No. 8773, to conduct an Archaeological Training Institute for high school students.

I am especially indebted to David M. Miller, photographer, North Museum, for the photographic reproductions used in the chapters by Kraft, Marchiando, and Kinsey; to Grant Heilman, Lititz, for the aerial photography; and to Charles E. Hunter for executing many of the line drawings. I am also grateful to Florence Starr Taylor, artist, North Museum, for her skill in rendering the six artifact drawings appearing in the Summary. I have profited from the advice and counsel of many of the Museum staff members. I am grateful to all the property owners who permitted us to traverse and search their fields for evidence of aboriginal activities; to Vernon Leslie, Honesdale, Pennsylvania, who shared his site numbers and his considerable knowledge of the area with us; and to all the student fieldworkers and laboratory assistants who worked faithfully and contributed their skills and enthusiasm to the project.

The Pennsylvania Historical and Museum Commission has made possible this volume by including it in their publication program. We would like to express our appreciation to the members of the Commission and its Executive Director, Dr. S. K. Stevens; Dr. Donald H. Kent, Director of the Bureau of Archives and History; Mr. William A. Hunter, Chief of the Division of History, who supervised publication; and Mr. Harold L. Myers, Associate Historian, who handled publication.

We gratefully accept the contributions of those individuals who gave of their time and their special skills in making various technical analyses and identifications: John E. Guilday, associate curator, Section of Vertebrate Fossils, Carnegie Museum, identification of animal remains; S. Anthony Morse and other faculty members of the geology department, Franklin and Marshall College, geological analyses and identifications; John W. Price, Sr., curator of paleontology, North Museum, Franklin and Marshall College, fossil and geological identifications; William D. Sevon, geologist, Bureau of Topographic and

Geologic Survey, Commonwealth of Pennsylvania, flood plain soil profile analysis; Arthur W. Shively, biology department, Franklin and Marshall College, pollen analysis, soil acidity tests, and seed identifications; Minze Stuiver, director, Radiocarbon Laboratory, Yale University, radiocarbon assays.

We wish to thank the following institutions: East Stroudsburg State College; Forks of the Delaware Chapter, Society for Pennsylvania Archaeology; Lenape Chapter, Society for Pennsylvania Archaeology; and the Monroe County Historical Society.

We wish also to thank the following individuals for their valuable assistance: Mrs. Edwin B. Bartram, Kurt W. Carr, Peter DeGelleke, Mrs. Kenneth Dommel, Mrs. Elinor Fehr, Mary H. Fenstermacher, Mrs. Theodore B. Freeman, Dr. and Mrs. H. B. Freyermuth, Jeffrey R. Graybill, Mrs. Clinton Gulliot, John W. Hall, Russell G. Handsman, Henry Heisey, Barry C. Kent, Leroy J. Koehler, Thomas M. Missimer, Roger W. Moeller, J. Havard Macpherson, William A. Ritchie, Irving Rouse, Mrs. Betty Jean Shollenberger, William Strohmeier, Alfred Sumberg, Mr. and Mrs. Ralph Turn, Mr. and Mrs. Robert Vandercar, and Gregory R. Wentzel.

And, finally, I acknowledge the special contribution of my wife, Bette, whose patience and understanding contributed so much and in so many different ways.

W. Fred Kinsey, III

March 1, 1970

GLOSSARY

Occurring frequently in the text are a number of standard archeological terms. Our interpretation of these terms is based upon concepts refined by Willey and Phillips (1958: 11-43) and Ritchie (1965: xvi-xvii). To meet our particular requirements these terms have been slightly modified.

Site: any area of aboriginal occupation or use.

Component: the manifestation of a single archeological unit at a site.

Phase: an archeological unit possessing traits sufficiently characteristic to distinguish it from all other units, suggesting that it represents a single cultural group; it is spatially and temporally limited. Examples: Chance phase, Perkiomen phase, Bushkill phase.

Complex: a relatively broad archeological unit of a local sequence over a relatively long period of time; it implies a stage of cultural development embracing several phases which may or may not be sufficiently delineated to be recognized as phases. Examples: Delaware Valley Archaic complex.

Period: the largest archeological unit, it occupies a large geographic area over a long period of time and has an internal chronology composed of phases and complexes. Examples: Archaic, Woodland.

Stage: a technological and economic level of cultural attainment; it implies chronology in only very broad terms. Examples: hunting and gathering stage, horticultural stage.

Industry: a group of artifacts made of the same material. Examples: bone industry, stone industry, shell industry.

Assemblage: a group of artifacts representing an archeological unit. Examples: Orient assemblage, Owasco assemblage, Perkiomen assemblage.

Horizon: a regional trait of relatively brief duration. Examples: shell-tempered pottery, net-marked pottery.

Horizon style: a regional art style or motif of relatively brief duration. Examples: face effigies, Chance motif.

Tradition: a socially transmitted technological practice that may be traced through several different cultural assemblages over a wide area. Examples: broadspear tradition, Laurentian tradition, cord-decorated pottery tradition.

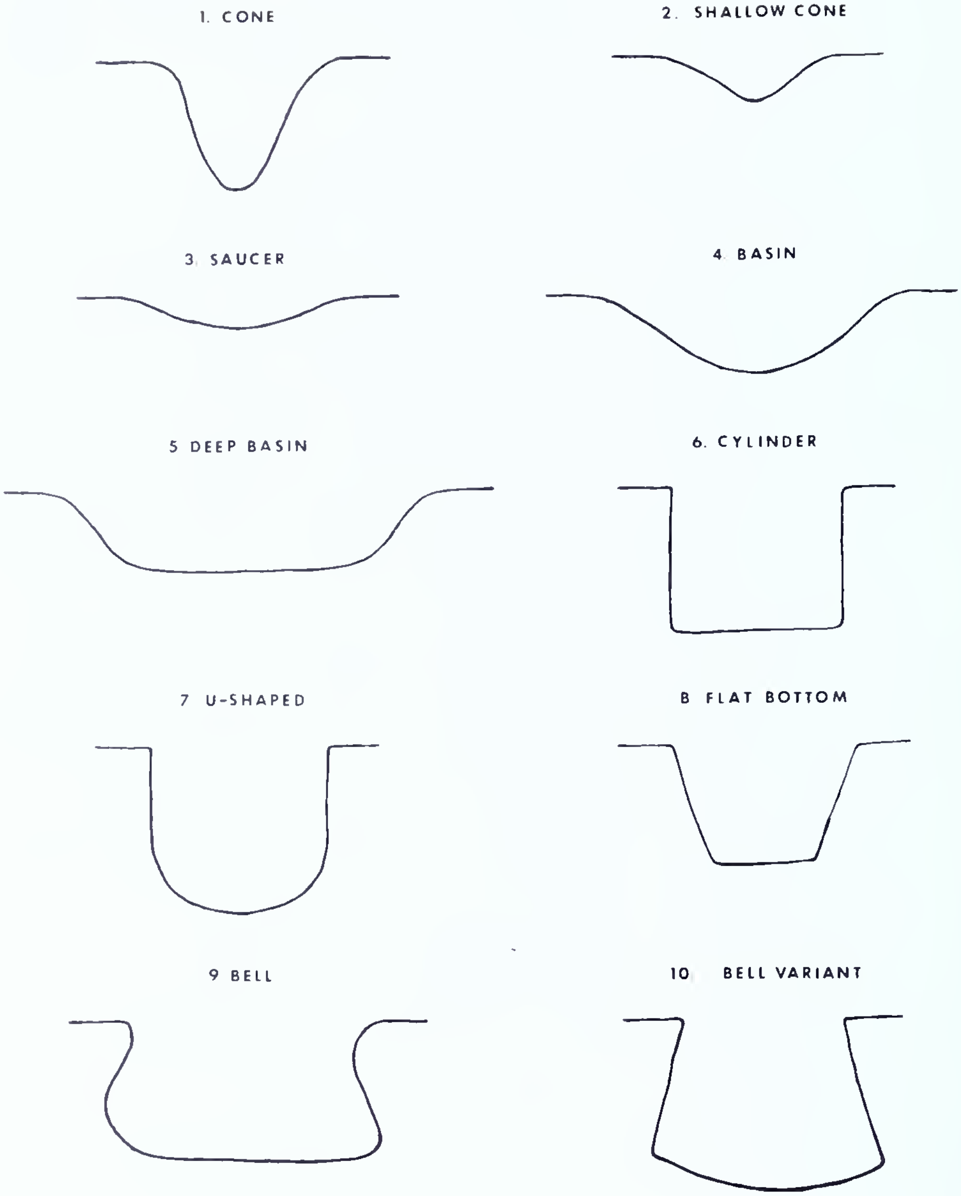

Fig. 2. PIT PROFILES.

Culture: sometimes used as a substitute for component and phase; a culture to be a culture would have to be represented by several components from several different sites, but this term has been overworked in the literature with the result that many archeological cultures do not correspond to true prehistoric cultures as implied.

Local sequence: cultural succession in a relatively restricted geographic area; in this text local sequence includes the area between the Delaware Water Gap and Port Jervis.

Regional sequence: cultural succession over a broad geographic area; in this text, region is defined as most of New Jersey, coastal New York and southern New England, eastern Pennsylvania, and eastern New York.

A number of new projectile point and pottery types are defined and introduced for the first time. These together with well-established and more familiar types are described and discussed for the Upper Delaware Valley in the Appendix to this volume. The projectile point analysis is largely based upon the Havard Macpherson Collection of the North Museum, Franklin and Marshall College. Other terms, such as the word Tribal applied to late incised pottery, are treated in the pottery Appendix.

Three new archeological manifestations have been formulated. The Delaware Valley Archaic complex is a regional expression of the Late Archaic. The Dry Brook phase, together with the Orient phase, constitute the fishtail tradition and the former apparently derives from the Susquehanna and Frost Island phases. The Bushkill complex is an Early-to-Middle Woodland complex nearly equivalent to the Lagoon complex of Martha's Vineyard (Ritchie 1969b: 224-8). These manifestations are discussed herein in various places but particularly on pages 364-9 and 191-3, respectively.

Numerous pits are the most conspicuous feature of the Late Woodland components. Pits are described on the basis of profile, which is illustrated by 10 outline drawings in Figure 2.

The Miller Field Site

Warren County, New Jersey

HERBERT C. KRAFT*

INTRODUCTION

THE MILLER Field site is located 10 miles north of the Delaware Water Gap bridge and about one mile northeast of the early Dutch copper mines at Pahaquarra. The map coordinates are 41 degrees, 00 minutes, and 40 seconds north latitude and 75 degrees, 00 minutes, and 10 seconds west longitude.

The site has important assets in terms of natural resources, soil conditions, and geographic location. A silted knoll traverses the field from north to south. This knoll has an average elevation of nine feet above the surrounding terrace and is about 25 feet above the normal flow level of the Delaware River. This elevation provides good drainage after rains and gives reasonable insurance against flood devastation, a prime requisite for any campsite.

The Delaware River is about 800 feet to the west of the knoll while Vancampens Brook meanders through a forest on the eastern edge of this eminence. The brook may have played the greater role in the everyday life of the Indian because it was easily accessible and provided clear, cool, potable water. The Delaware River, however, furnished a variety of freshwater fish and mollusks and doubtless served as an important means of canoe travel to north and south. The forest yielded firewood and materials for the construction of houses and tools. Seasonal supplies of edible nuts, such as butternut and hickory; wild grapes and berries; and numerous herbs, roots, and tubers could also be gathered here. Food and fur bearing animals were also hunted or trapped in this environment.

Some 2,000 feet to the east the land rises sharply to become part of the Kittatinny Mountains. Outcroppings of black flint are found in the Kittatinny limestones, and this flint was extensively exploited to provide material for the manufacture of points, knives, scrapers, and other implements. These same mountains, known as the Shawangunk Mountains in New York, extend almost to the Hudson River at present-day Kingston, and together with the Catskill Mountains on the west may have been sufficiently confining to influence trade and cultural contact between the Mohawk Valley and the tri-state area, as pottery styles and artifact types suggest.

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Archeologically, the Miller Field site has been known and surface-collected for more than 30 years. The New Jersey State Museum conducted two limited excavations on the field in 1959 and in 1965. However, the most persistent work has been done by F. Dayton Staats, of Oxford, New Jersey, an amateur archeologist who in eight years has excavated over 500 features. An examination of his collection revealed an abundance and diversity of pottery types and lithic artifacts as well as historic trade goods including glass beads, copper implements, iron ware, and kaolin pipes (Fig. 12). The fact that these European items originated in Indian graves and refuse pits was especially exciting because such occurrences are rare in New Jersey archeology. A seal-spoon and a seal-impressed black glass wine bottle suggested a date of about A.D. 1650 to A.D. 1710 for this Historic component. Subsequent testing on the site revealed sizeable areas that were still undisturbed save for minor plow damage. Numerous post-molds indicated the possible presence of house patterns, a situation of prime importance since clear-cut evidence of house plans had in the past eluded New Jersey archeologists.

In June, 1967, the author and a crew of 18 students and faculty members from Seton Hall University began systematic excavations on the southeastern end of the knoll. A bulldozer was employed to remove a dense growth of weeds and about four inches of root-bearing topsoil. The remaining four to six inches of humus above the plow sole was later cleared by hand and screened. This soil proved to be the repository of Early-to-Late Woodland artifacts. The cleared excavation plot was divided into 10-foot squares. A total of 97 such squares was excavated in 1967 and an additional 45 were excavated in 1968 for a total horizontal exposure of 14,200 square feet (Figs. 3-5).

Two 10-foot-deep test squares were dug at diagonally opposite corners of the excavation to determine the soil zones and to check the stratigraphic pattern of the knoll. Disappointingly, only two zones manifested themselves, a plow zone from the surface to about nine inches deep and a homogeneous buff-colored silt that extended from the bottom of the plow zone to a gravel deposit some 110 inches further down. Since the site was found to be multicomponent, excavation by means of natural or cultural stratification was precluded. It was, therefore, decided that excavation would be carried out in three-inch levels to an ultimate depth of occupation at 27 inches below the plow zone, hereinafter referred to as b.p.s. (below plow sole). Each three-inch layer was designated by a separate letter: Level A identified the plow zone; Level B: zero inches to three inches b.p.s.; Level C: three inches to six inches b.p.s., and so on to Level J at 24 inches to 27 inches b.p.s. All excavated soils were screened through one-half-inch hardware cloth and when necessary through one-quarter-inch mesh.

The floor of each level was troweled in order to ascertain the presence of postmolds, pits, or other evidence of cultural disturbance. Suspected postmolds were sectioned in order to determine their validity. Refuse and storage pits were similarly sectioned to expose leaf-mold layers, lenses, and other types of stratigraphic detail.

Tests for soil composition and acidity were made by Steven J. Toth, professor of soil chemistry, Rutgers, The State University. Acid soil conditions prevailed throughout the excavation with pH values ranging from 4.7 to 6.0. This negative soil condition helps to account for the poor preservation of organic materials.

Features of the Late Woodland and Historic Period

Most of the artifacts and pottery attributable to the Late Woodland components were found scattered throughout the topsoil, the remainder were located in pits, hearths, and burials that intruded into the subsoil. Hundreds of postmolds also descended from the plow zone, and from these we could discern three distinct house patterns and a possible sweat lodge.

The pits were widely scattered over the Miller Field site. By 1967, Staats had dug 428; Seton Hall University Museum excavated 193, for a total of 621. Others were dug by several private and professional groups in years past. Confining our analysis to the 140 pits excavated by the Seton Hall University group from the southeastern end of the field, we can differentiate the following pit shapes: basin (55), silo (44), saucer (38), and bell (3).

Saucer-shaped pits vary in diameter from 19 inches to 60 inches, with depths ranging from 4 inches to 10 inches. Most of these pits contained ash and charcoal-flecked fill, but fewer than half contained artifacts. However, one saucer-shaped pit (A-F18) located within

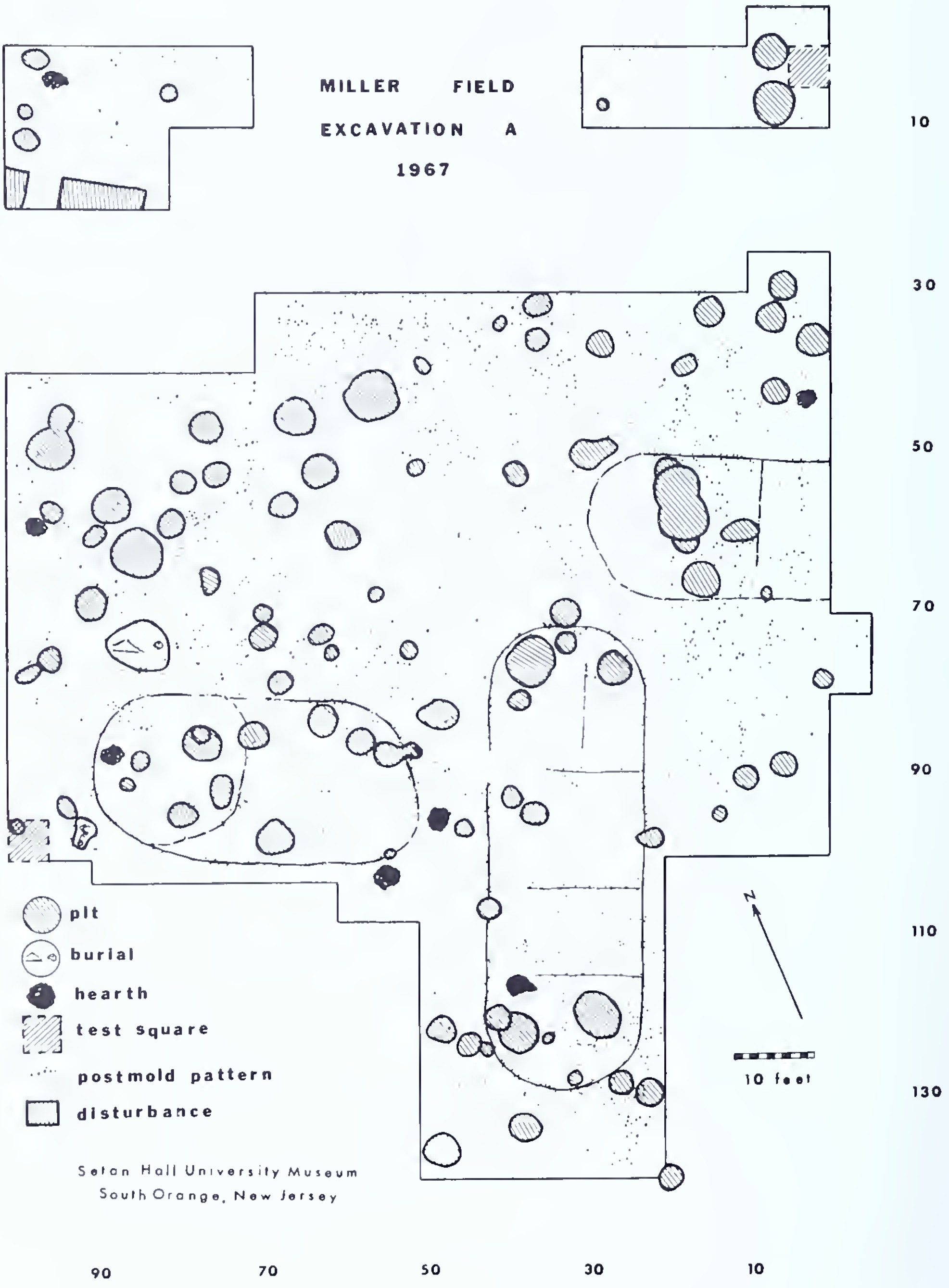

Fig. 3. EXCAVATED AREA, OF THE MILLER FIELD SITE, Excavation A, 1967. Late Woodland longhouse patterns, postmolds, pits, hearths, burials, and other features.

the longhouse pattern yielded four triangular projectile points, five teshoas, one anvil stone, two elongated pebble tools, two trimmed rectangular netsinkers, two polished celts, a serrated slate pendant, and a variant rim sherd of Kelso Corded style that was both cord-decorated and incised (Fig. 11 E).

The deep basin or bowl-shaped pits had circular or mildly oval apertures. The diameters varied from 18 inches to 71 inches, with an average of about 36 inches. Depths ranged from 9 inches to 36 inches, with an average of about 24 inches. The bottoms of these pits were invariably concave or bowl-like and no form of lining was recognized. A wide variety of lithic tools and projectile points of the Levanna and Madison types was found in these pits, together with numerous examples of Sackett Corded, Kelso Corded, and Oak Hill Corded pottery vessels. A smaller number of incised vessels was excavated from such pits as well.

Among the more interesting features, for a variety of reasons, are the deep cylindrical or silo-shaped pits. These had diameters of 24 to 85 inches and depths up to 89 inches. The majority, however, had diameters of about 40 inches and depths of 30 to 40 inches. The walls were invariably straight and perpendicular, possibly having been planed smooth with teshoas. The latter were very often discarded into the pit bottoms. Furthermore, the walls of the deeper pits were frequently puddled to make them more impervious to ground water seepage. This fact was established by mechanical soil analyses of samples taken from the walls of a number of such pits, which were in turn compared with soil samples taken from the pit fill and from the earth beyond the pit walls. Toth also made these soil analyses.

The floors of these features were usually straight and hard-packed. Marsh grass or other straw-like matting was frequently encountered at the bottoms of these deep pits, and between the fibers we occasionally found considerable quantities of charred beans, corn kernels, corn cobs, corn husk, and nuts. The deeper pits often had postmolds in the floors suggesting a central ladder, a frame to support storage shelves, a central support for the pit cover, or any combination of these. A special effort was made to carefully trowel and section all pit floors to ascertain the presence of these postmolds, but they existed only in the deeper storage pits. The silo-shaped pits have a temporal range from very late prehistoric to historic times. Most of the European trade materials were found in these pits, and so too were the Munsee pottery and other late incised wares.

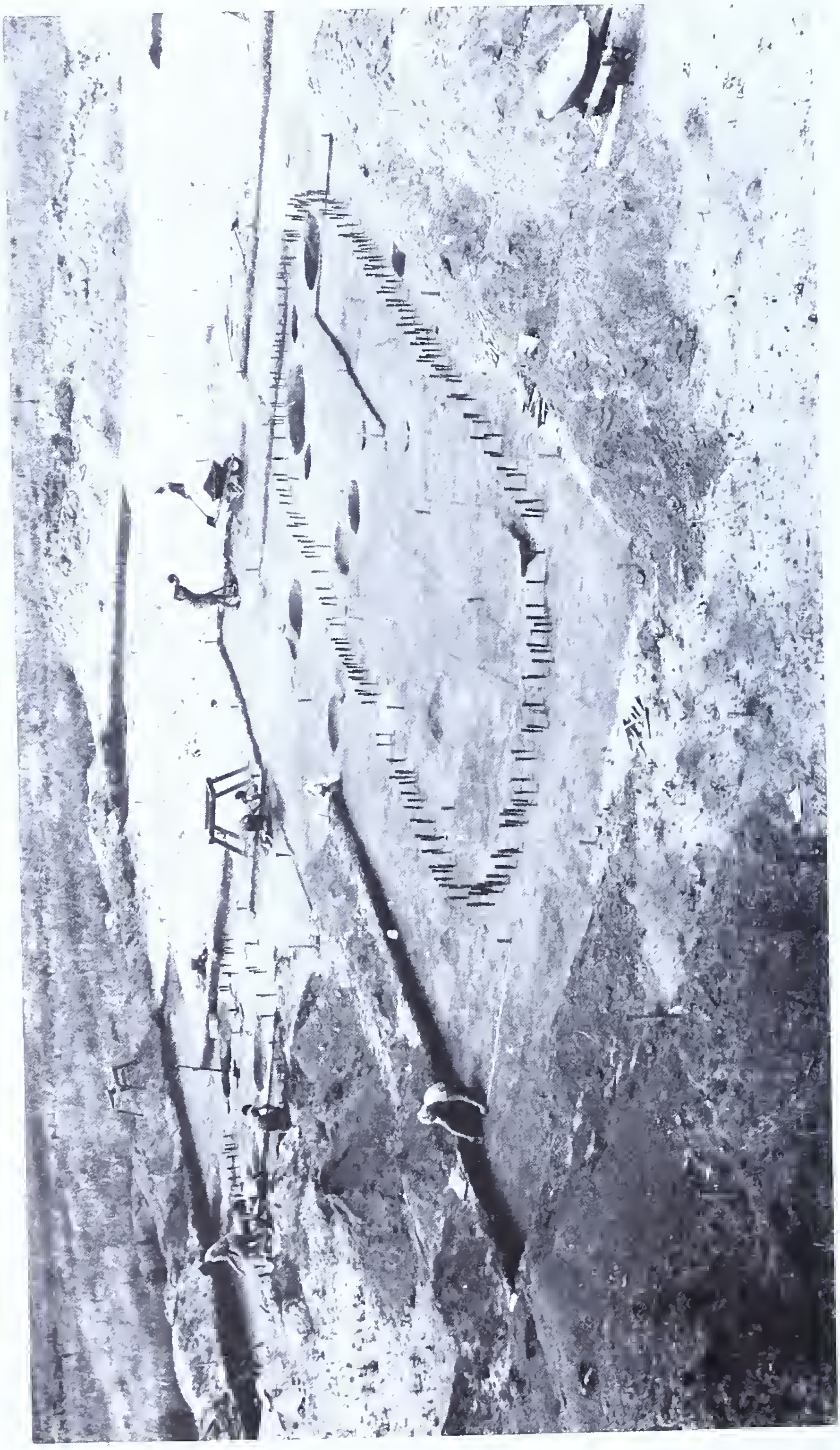

Fig. 4. EXCAVATION OF THE MILLER FIELD SITE, Excavation A, 1967. The 60-foot longhouse is delimited by stakes marking individual postmolds. Refuse-filled pits and storage pits are also shown. A second longhouse is in process of excavation at upper left.

Only eight identifiable Late Woodland hearths were found, but the abundance of fire-cracked rock scattered throughout the topsoil suggests that others might have been plow-scattered and destroyed in the course of two centuries of plowing. Most of the hearths were circular to oval and measured 27 to 35 inches in diameter. River cobbles, some thermally fractured, were generally tightly packed to a depth of up to eight inches at the center and less deeply along the edges. In some hearths the charcoal was quite dense, but in general the wood had been thoroughly combusted and only ash remained. Charred butternut and hickory nut shells were found in two hearths. Small fragments of bone were also occasionally encountered, but these were so calcined as to be unidentifiable. Hearths were located in each of the longhouses and also outside these structures. One hearth was placed within 10 feet of the presumed "sweat lodge" mentioned below, and may have served to heat the stones for use in this feature.

The Indians presumably built some of their campfires directly upon the ground. Numerous burned and charcoal-stained areas were encountered at the bottom of the plow zone, and two charred logs were located.

Only seven burials were found, although several others were excavated by Staats. Bone preservation was exceedingly poor, and remnants varied from tooth crowns to skulls, pelvises, and long bones. Many of the burials were so shallow that the plow frequently disturbed them. Most Late Woodland burials were tightly flexed and interred in rather shallow pits varying from about 12 to 23 inches below the surface. There was no particular orientation of the body. Grave goods were not placed with the burials except in one instance when a round-bowl pipe (Fig. 8 B) and a celt (Fig. 8 H) seemingly made from a broken pestle were placed with the corpse. Two Historic burials were identified by the grave goods. One possessed a long string of opaque white seed beads, and the other a silver-plated seal-spoon, (Fig. 12 Q) which, judging from its position on the sternum, might have been suspended from a necklace. Two possible winter burials were at the bottom of deep silo-shaped pits. One had been placed in the pit with the left leg extended and the right leg flexed. The fill on top of this burial contained more than 1,200 black flint chips. The other burial was flexed and laid on its back with the hands and arms folded over the chest. The narrow dimensions of this pit forced the head into a more or less perpendicular position so that the chin rested upon the sternum. Too few intact bones were located to permit anthropometrical analyses. No pathological evidence was encountered, save for dental caries, nor could we find any evidence of violent death.

The remains of two dogs were discovered. Both showed evidence of having been eaten. The craniums were broken open, presumably to extract the brain, and only a few cracked postcranial bones were associated.

The Miller Field site, unlike most other recorded New Jersey sites, contained hundreds of postmolds (Fig. 3). Because of this fact we expended particular care in finding the stratigraphic soil-color change which delimited the plow zone from the undisturbed subsoil. The suspected postmolds were horizontally well defined, and in order to eliminate rodent burrows all postmolds were sectioned before entering them into the record.

In the 1967 excavations we were thus able to define three longhouse patterns and a sweat lodge. One longhouse pattern, 60 feet long and 20 feet wide extended along the ridge in a roughly north-south direction (Fig. 4). The second house apparently started out as a circular house 22 feet in diameter. Subsequently it was extended into a longhouse 38 feet long and 22 feet in width. This was erected with an east-west orientation and was located slightly to the west of the house previously described. A third, and only partially excavated longhouse, also had an east-west orientation. It was not possible to determine its original length because the eastern end had been disturbed by previous excavations.

The longhouses on the Miller Field site differ in several important respects from those of the Iroquois. All were double posted, indicating that an inner framework was first erected, consisting of poles two and a half to three inches in diameter. These posts were twisted into the ground to a depth of between 9 and 18 inches b.p.s. They were seldom more than 12 inches apart, suggesting that the bark covering over the frame was of a rather limited size. A second set of posts encircled the inner frame and was presumably secured to it in such a way that the bark covering was sandwiched between the uprights. The ends of the longhouses were round, and the postmolds were uninterrupted. The only entrance was near the center of one of the long sides. Partitions extended from one wall to within about four feet of the opposite wall providing a passage along one side of the longhouse that gave access to all sections. The 60-foot longhouse had three east-west partitions and an additional divider in the center of the northern end (Fig. 3). The doorway in this instance was located on the western side. Deep silo-shaped pits, presumably food cellers, were located inside the ends of these longhouses. Similar pits were located close to the outsides of these houses as well.

There is, of course, no way of determining with certainty whether these three longhouses were contemporary. Their position perpendicular to, and close to each other suggests that they might have been. Yet the arrangement of these dwellings seems to be unique and peculiar. The longhouses were not enclosed by a stockade, and it seems likely that these people lived a peaceful life without fear of attack.

Postmolds figured prominently in one other feature. A small structure which may have been a sweat lodge was found on the western side of the excavation. This feature consisted of a flat-bottomed pit three feet in diameter and two feet deep surrounded by seven postmolds. The postmold configuration suggests that a small hut might have been superimposed above the pit. The floor of the pit was

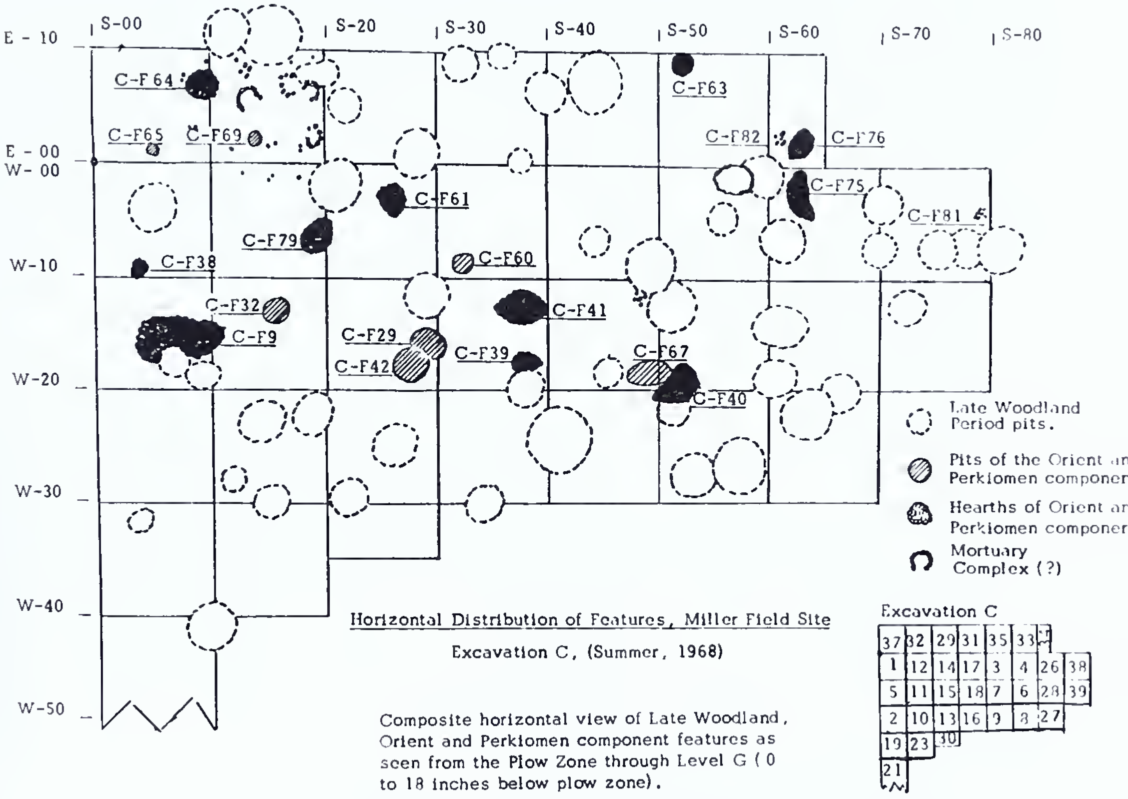

Fig. 5. COMPOSITE VIEW OF THE DISTRIBUTION of Early and Late Woodland and Transitional period features at the Miller Field site. Excavation C, 1968, Levels A-H (0-18 inches b.p.s.).

curiously provisioned; more than one-half of it was tightly covered with moderate-size cobbles, while the remainder of the floor, sufficient for one man to stand comfortably, was hard-tamped. A small hearth nearby presents the possibility that stones were heated here and transferred to the enclosure where water, deer fat, tobacco, or other forms of vapor-producing substance could be poured over the hot stones (Fig. 3, coordinates 90W70S).

The hundreds of other postmolds throughout the excavated site provided no clear-cut patterns. They probably represent the remnants of posts that served an infinite number of uses, as for example drying racks, fireplace frames and spits, and so on.

FEATURES ASSOCIATED WITH THE ORIENT, PERKIOMEN, AND KOENS-CRISPIN COMPONENTS

Levels B to J, extending from below the plow zone to 27 inches b.p.s. contained 8 pits, 14 hearths, and 24 postmolds (Fig. 5). These subsoil levels contained the Orient, Perkiomen, and Koens-Crispin components and certain projectile types that probably belong to the earlier Archaic stages. Pertinent information relating to these features follows:

Pit No.	*Feature No.*	*Level*	*Type*	*Dimensions Inches*	*Depth Inches*	*Association*
1	A-F24	D	Basin	25 x 30	7	Orient
2	A-F29	B	Saucer	18 (dia.)	7	Orient ?
3	C-F32	C	Saucer	36 (dia.)	7	Orient
4	C-F42	D	Basin	32 x 42	16	Perkiomen
5	C-F60	F	Sub-conical	22 (dia.)	9	Perkiomen
6	C-F65	E	Sub-conical	12 (dia.)	5	Perkiomen ?
7	C-F76	F	Basin	26 x 39	15	Perkiomen
8	C-F69	E	Basin	12 x 15	8	Perkiomen ?

Pit 1 contained scattered charcoal and ash, but was sterile except for a few jasper chips. Pit 2 had a dense charcoal-flecked fill. It contained two Perkiomen broadspears, but the adjacent square held Orient phase artifacts suggesting the possibility that the Perkiomen points were out of context. Pit 3 held 337 siltstone chips and lesser numbers of flint and jasper flakes, but no diagnostic artifacts. This pit was located close to Orient Hearth 4, and the adjacent square yielded portions of an Orient type steatite bowl and two fishtail points.

Of the pits pertaining to the Perkiomen component, Pit 4 (Feature C-F42) proved to be of unusual significance. It contained five brown jasper Perkiomen broadspears, one Koens-Crispin point of argillite, a heat-shattered, polished pointed-poll celt or biconvex adze, more than a dozen hickory nuts, a few small lumps of red and yellow ochre, numerous jasper flakes, and charcoal. A radiocarbon assay of this charcoal yielded a date of 1720 B.C. ± 120 years (Y-2587). This is the oldest reported date for a Perkiomen component. The association of the Koens-Crispin point in this context raises two very important questions: (1) is the Koens-Crispin point coeval with the Perkiomen broadspear on the Miller Field site, or (2) does the Koens-Crispin point belong to a still earlier time? The latter alternative seems to be the more likely for reasons which will be discussed below.

Pit 5 (Feature C-F60) was situated about 10 feet southeast of Pit 4 and first appeared in Level F. No artifacts were located inside this pit, but the surrounding area contributed a brown jasper Perkiomen point and the basal portion of the only Susquehanna point from the site. Charcoal from this pit was radiocarbon dated at 1640 B.C. ± 100 years (Y-2588). Pit 7 contained several black flint flakes and a bi-pitted stone. It was situated close to Hearth 7, which appears to have been a hearth of the Perkiomen component. The major portion of a grooved atlatl weight was found near the opening of this pit. Pits 6 and 8 contained numerous large argillite flakes, but no diagnostic implements. These pits may have been associated with the Koens-Crispin component, but this cannot be verified.

The 14 hearths, like the pits, were distributed on various levels 3 to 24 inches b.p.s. The type and distribution of these hearths follows:

Hearth No.	*Feature No.*	*Level*	*Dimensions Inches*	*Depth Inches*	*Association*
1	A-F19	E	24 x 30	3	Orient
2	A-F20	D	23 x 29	3	Orient
3	A-F36	C	96 x 180	4-12	Orient
4	C-F9	C	38 x 74	7	Orient
5	C-F38	B	17 x 17	4	Early Woodland
6	C-F39	B	18 x 34	4	Orient
7	C-F40	E	36 x 40	6	Perkiomen ?
8	C-F41	D	36 x 52	8	Perkiomen ?
9	C-F61	C	21 x 34	7	Orient
10	C-F63	G	24 x 36	8	Perkiomen
11	C-F64	E	14 x 18	5	?
12	C-F75	D	32 x 58	10	Orient
13	C-F76	D	28 x 34	6	?
14	C-F79	D	27 x 38	6	Orient

Of the hearths attributable to the Orient phase, Hearths 3, 4, and 9 are of special interest. Hearth 3 was of unusual size, being 15 feet long and 8 feet wide with scattered fire-cracked rocks trailing off beyond these dimensions. A jasper fishtail point and a fishtail-base knife were found in this feature. Hearth 4 contained fishtail points and fragments of a "reused half" of a steatite bowl (Fig. 9A) similar to the types Ritchie found at the Jamesport and Sugar Loaf sites on Long Island (Ritchie 1959: 65, 74; Kraft 1970: 108-9). Hearth 9 was situated on top of a saucer-shaped pit, which, like the hearth, contained abundant charcoal. The area surrounding the base of the hearth contained four fishtail points and a fishtail-base drill. Charcoal from this feature yielded a radiocarbon date of 1220 B.C. ± 120 years (Y-2589), providing the date for the Orient component.

As would be expected the hearths associated with the Perkiomen component were found at a greater depth than the Orient hearths. Hearths 7 and 8 consisted of tightly packed river cobbles with some fire-cracked rock and broken and pitted implements intermixed. These hearths were located in the upper part of saucer-shaped depressions. Hearth 7 contained numerous anvil stones, pitted hammerstones, a milling stone, and an apparent whetstone. Hearth 8 was devoid of artifacts, but Perkiomen points and a Koens-Crispin point were found nearby in the same level. Hearth 10 was situated 16 to 24 inches b.p.s. A fragment of a milling stone was contained in the hearth, and an entire milling stone was located within one foot of this hearth. These milling stones and five others excavated from these levels are distinctive in having their undersides flaked off. It had been assumed heretofore that such grinding implements were not employed in the Orient cultures (Ritchie 1959: 47), and they have not been cited in either the Susquehanna Soapstone culture (Witthoft 1953) or in the Frost Island phase (Ritchie 1965a: 155-63; 1969a: 156-64).

The 24 postmolds discovered in the subsoil originated at the C and D levels (six to nine inches b.p.s.) and continued into Level F. Five of these were random occurrences, but 19 were located in Squares 12, 32, and 37 (Fig. 5). It seemed at first that these postmolds might be describing a small house pattern, but deeper excavations in Square 32 suggested instead that this might possibly have been a charnel house or mortuary structure (Kraft 1970: 46-50). Square 32, Level E, contained four horseshoe-shaped arcs consisting of a single tier of carefully laid fire-cracked stones. The openings of these arcs were directed towards a common center (Fig. 5). There was no evidence of bone (the pH value of the soil was 4.7), nor were there any mortuary offerings in the immediate surroundings, except for a few lumps of

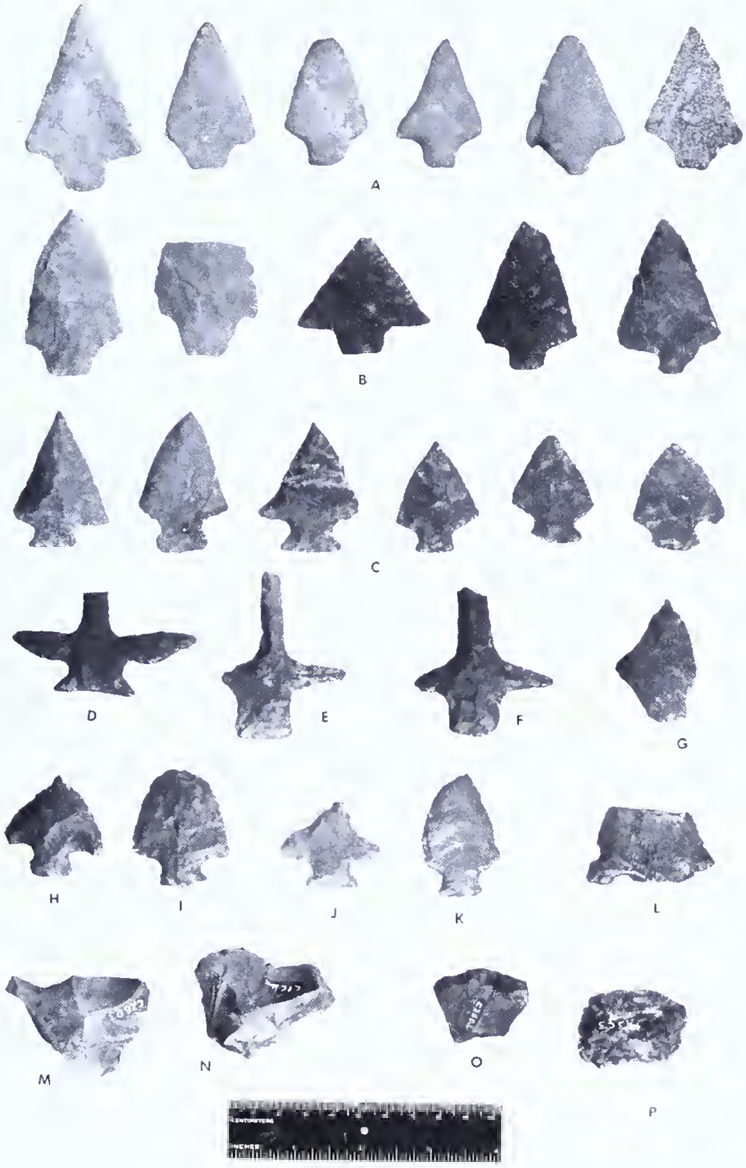

Fig. 6. CHIPPED STONE ARTIFACTS of the terminal Late Archaic and Transitional period broad spear tradition, from the Miller Field site: A, Koens-Crispin broad spears of argillite; B, Lehigh and Snook Kill broad spears of flint and jasper; C, Perkiomen broad spears of jasper; D-F, Perkiomen cruciform or winged drills; G, H, J, Perkiomen broad spears reworked into gravers; I, Perkiomen broad spear reworked into a scraper; K, knife made from a broad flake with Perkiomen-type base; L, bilaterally notched wing tip of broken Perkiomen broad spear; M, utilized flake, combination concave scraper and graver; N-P, utilized flake scrapers of jasper.

red ochre. However, an analysis of the soil by Toth revealed higher traces of phosphate and calcium than was normal for this area, suggesting osseous residue.

If indeed this was a mortuary complex, then it is possible that four interments (cremation, bundle, or otherwise) might have been placed on the floor and encircled with the stones. Earth might then have been placed over the burials to a depth of nine inches or more. Finally the poles, represented by the postmolds referred to above, might have been driven into this presumed ossuary mound preparatory to building some sort of frame structure over the interments.

POTTERY

The Early and Middle Woodland stages are poorly represented on the Miller Field site, and this fact is especially noticeable in the paucity of ceramic wares attributable to the Early series and to Point Peninsula types. By contrast there is an abundance of Late Woodland pottery types including both local and diffused styles. The following pottery types were excavated during two seasons on the Miller Field site. The number of vessels attributed to each type represents the estimated number of separate, identifiable vessels based upon adequate rim and/or body sherds. The progression cited is from late to early.

		Estimated Number of Whole Vessels	
Incised Collar Series			
Munsee Incised		9	(Fig. 11 A, G)
Otstungo Notched		6	
Garoga Incised		13	
Durfee Underlined		5	
Deowongo Incised		17	(Fig. 11 C, F)
Chance Incised		23	(Fig. 11 D)
Other Incised			
Bowman's Brook Incised		4	
Overpeck Incised		3	
Intermediate Series			
Iroquois Linear		2	(Fig. 11 I)
Bainbridge Linear		2	
Oak Hill Corded		3	(Fig. 11 B)
Kelso Corded		35	(Fig. 10 C, F)
Owasco Corded Collar	30		
Bainbridge Collared Incised	2		
Owasco Corded Collar Variants	3		(Fig. 11 E)
Castle Creek Punctate		7	(Fig. 10 A)

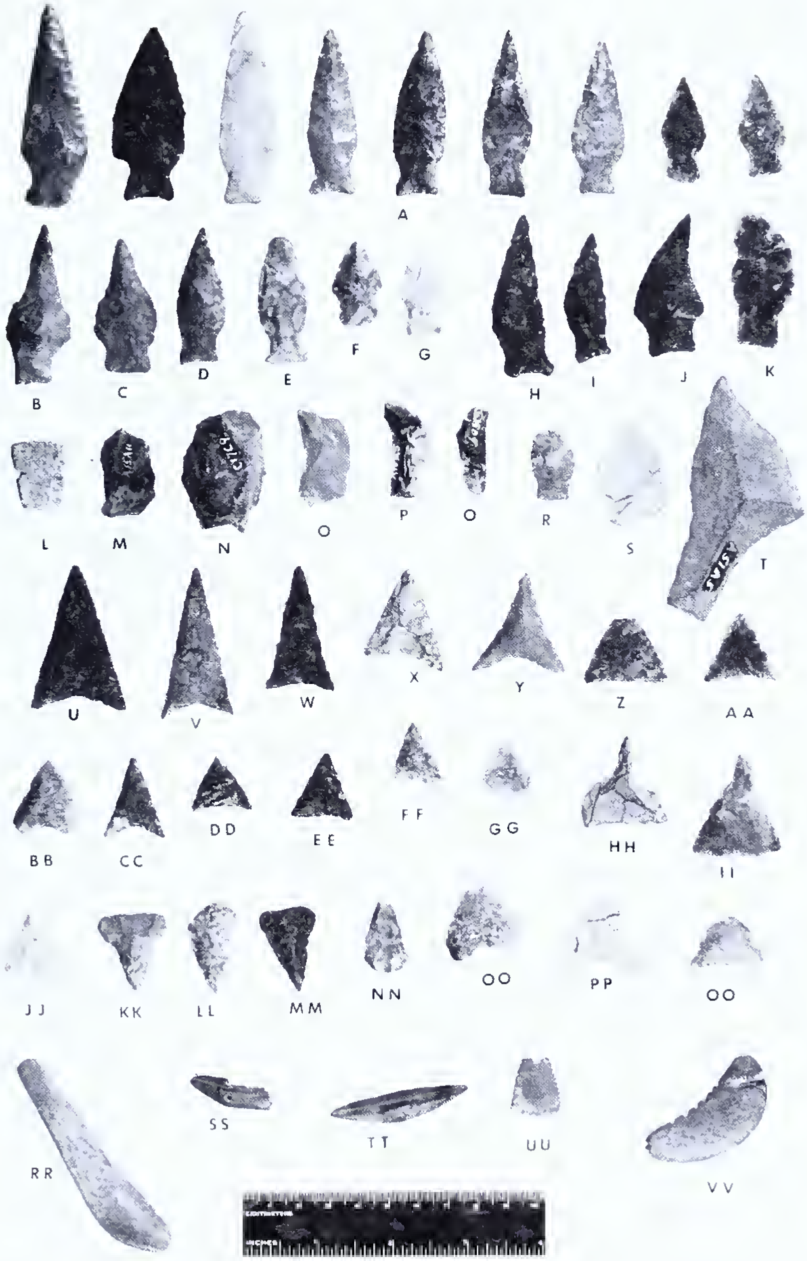

Fig. 7. CHIPPED STONE ARTIFACTS of the Transitional and Woodland periods from the Miller Field site: A, Orient fishtail points; B-F, fishtail drills; G, fishtail scraper; H, I, fishtail knives, type 1; J, K, fishtail knives, type 2; L, side-notched steatite bead, fishtail tradition; M, O, utilized flake scrapers; N, utilized flake snub-nose scraper; P, Q, utilized flake hafted knives (?); R, fishtail scraper; S, pointed argillite flake; T, hafted (?) argillite knife; U, V, W, elongated triangular points; X, Y, CC, Madison points; Z-BB, DD-FF, generalized triangular points; GG-JJ, gravers or perforators; KK-MM, triangular scrapers; NN, OO, possible strike-a-lights; PP, QQ, repointed triangular points; RR, elongated pebble chisel; SS, TT, possible awl sharpeners; UU, serrated slate pendant; VV, notched amulet (?).

Owasco Series			
Sackett Corded		43	
Owasco Platted	10		
Owasco Herringbone	6		(Fig. 10 B)
Owasco Corded Horizontal	19		
Owasco Corded Oblique	2		
Owasco Plain (new type)	2		
Owasco Incised Neck (new type)	2		
Owasco Variant	2		(Fig. 10 D, G)
Canandaigua Plain		20	(Fig. 10 E)
Levanna Cord-on-Cord		5	
Carpenter Brook Cord-on-Cord		2	
Wickham Corded Punctate		5	
Clemson Island Series			
Clemson Island		6	
Early Series			
Brodhead Net-Marked		2	
Vinette I		1	
Ware Plain		1	
Steatite Tempered			
Marcey Creek Plain		2	
Stone Bowls			
Smoothed Exterior Steatite Vessels		2	(Fig. 9 A)
Chisel-Marked Exterior Steatite Vessels		2	(Fig. 9 B)

Most pottery types are adequately described in the Appendix. However, the following may be briefly treated here since they have not been identified in the Upper Delaware Valley heretofore: Owasco Plain, Owasco Incised Neck, and Ware Plain.

Owasco Plain is a new type that is generally similar to Canandaigua Plain (Ritchie and MacNeish 1949: 110). It differs in having the addition of an encircling band of oblique corded paddle-edge impressions at the shoulder of the vessel. Necks are smooth and undecorated, but lip and/or inner rim may be cord-impressed. The body is elongated and cord-marked in typical Owasco fashion.

Owasco Incised Neck is a new type that has representation on the Miller Field site and on several sites extending south to the Gap. The Owasco Incised Neck type has the typical Owasco vessel form with the addition of incised diagonal lines on a smooth neck with corded-stick or paddle-edge impressions on shoulder, lip, and rim. The rims are often extremely everted at the lip.

Ware Plain pottery was first described by McCann (1950: 316) and named after the Ware site in Salem County, New Jersey. This pottery is generally similar to Marcey Creek Plain (see Appendix) in all respects except tempering material. It is a vessel of oval or rectangular shape with a flat bottom, irregular surface, curved to straight sides, and occasionally handles or lugs are present at the ends. The temper usually consists of quartz or granitic grit, coarse sand, or crushed limestone (Kraft 1970: 116).

The association of steatite bowls with the broadspear and fishtail traditions has been noted previously (Witthoft 1953; Ritchie 1959; 1965a; 1969a). The generally flat-bottomed type with chisel-marked exterior is believed to be earlier and to pertain to the Perkiomen and Susquehanna phases, while the more round-bottomed, smooth-exterior type is said to have its provenience in the Orient phase of the fishtail tradition (Ritchie 1965a: 161; 1969a: 162). Both types of stone bowls are found on the Miller Field site.

Two vessels of the chisel-marked-exterior type are represented by lip, side, and bottom fragments, and these were found in a Perkiomen context. One has straight sides emerging at an angle of 100 degrees from the base; the bottom is relatively flat and smooth and is blackened from soot and fire. The sides are vertically corrugated from lip to bottom. The uniformity of the parallel channels denotes the employment of a very narrow chisel or gouge, the average furrow being less than .2 inch wide and .05 inch in depth. It is impossible to estimate the total length or width of this vessel when it was whole, but the remaining wall fragments suggest that it was at least four inches deep.

Portions of two smooth-exterior steatite bowls were found in unquestionable Orient association. One steatite vessel is represented by a reused half of a bowl that may originally have been 12 to 24 inches in length, based upon a configurational projection of the remaining half. The actual portion restored from sherds found in Hearth 4 and Level C of surrounding squares measures 6.5 inches in length from lug to the reworked basal lip edge (Fig. 9 A). The width is 7.5 inches and the height is 4 inches. Originally the bowl had an oval shape. The lug extends less than a half inch, barely enough to insure a secure grasp. No decorations were employed. This vessel is of unusual interest because it has counterparts in the Orient mortuary complexes on Long Island (Ritchie 1959: 65, 74; Kraft 1970: 104-5, 108, 133-4). When this bowl was originally broken, half the walls and base were rounded and smoothed in the manner of a scoop. The fact that charred organic matter still encrusts not only the base, but extends over the rounded edges gives evidence of the continued employment of this half bowl as a cooking vessel. Several large fragments of a second Orient type steatite bowl, with repair holes, were also found in Level C. The configuration and curvature of these sherds do not match those of the reused half-steatite bowl described above.

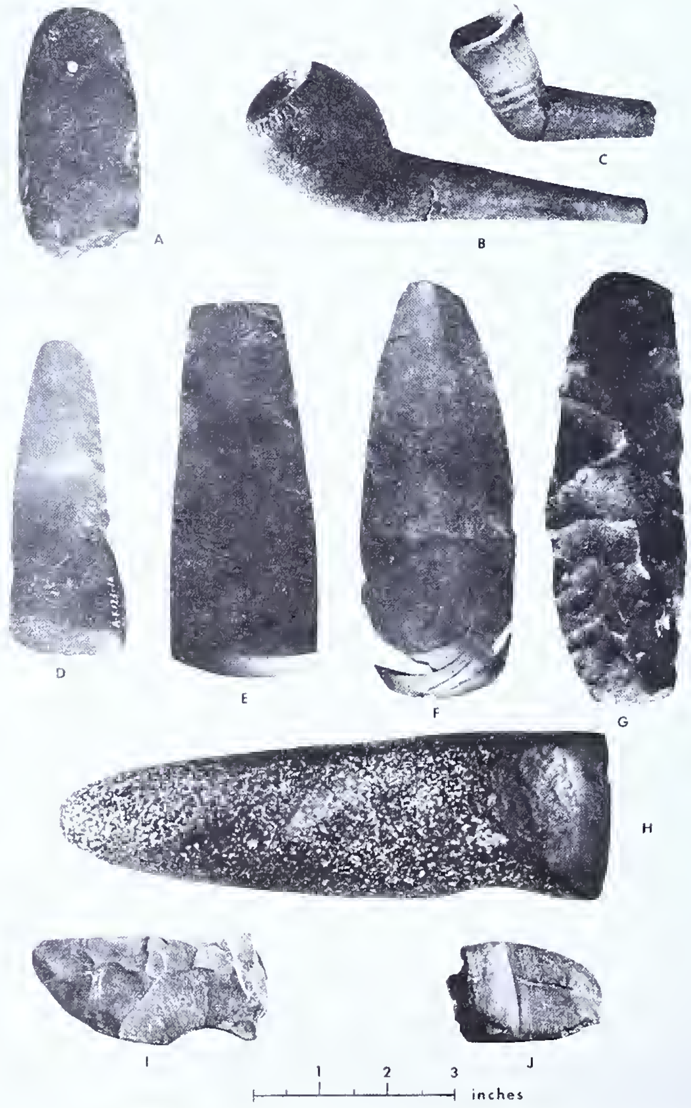

Fig. 8. ARTIFACTS OF THE TRANSITIONAL AND WOODLAND PERIODS from the Miller Field site: A, slate pendant, Late Woodland; B, C, clay pipes, Late Woodland; D, celt showing additional use as whetstone, Late Woodland; E, celt. Late Woodland; F, polished, pointed-poll celt or adze blade, Perkiomen component; G, chipped celt or adze blade, Perkiomen component; H, celt, possibly made from a broken pestle, Late Woodland; I, notched atlatl weight, fragment, Transitional; J, drilled atlatl weight, fragment, Transitional.

Stone Artifacts

Projectile Points and Related Tools

The projectile points excavated from the various levels on the Miller Field site easily fit the descriptions given in Witthoft (1953) and Ritchie (1961) and provided in the Appendix. Broken projectiles or excessively resharpened projectiles were sometimes altered to serve other uses as drills, scrapers, or knives. Occasionally too, an otherwise diagnostic point was pressed into service as a drill or knife, the evidence in this case being discernible in the striations or wear polish. The categories below include both the diagnostic projectiles and the tools derived from these projectile types. Uncertain types, preforms, or blanks have not been included.

It should be noted that I prefer to retain the Orient, Perkiomen, and Susquehanna components within the Transitional period after Witthoft (1953) and Ritchie (1965a and 1969a), and the Koens-Crispin and Lehigh components within the Terminal Archaic period (Kraft 1970: 55-9). The concept employed elsewhere in the present work considers the Orient fishtail tradition to be terminal Late Archaic to Early Woodland, while the other cultures are included in the Late Archaic broadspear tradition.

Late Woodland		
Madison—31 (Fig. 7, X, Y, CC)		
Lithic preference		
Flint	28	
Chert	1	
Jasper	1	
Argillite	1	
Levanna and Generalized Triangular—127 (Fig. 7 Z, AA, BB, DD-FF)		
Lithic preference		
Flint	74	
Chert	48	
Jasper	3	
Argillite	2	
Elongated Triangular—11 (Fig. 7 U-W)		
Lithic preference		
Flint	10	
Jasper	1	
Triangular Drills or Preforms, Flint		9 (Fig. 7 GG-JJ)
Triangular Knives, Flint		2
Triangular Scrapers, Flint		5 (Fig. 7 KK-MM)
Early Woodland		
Rossville—5		
Lithic preference		
Flint	2	
Argillite	2	
Chert	1	

Transitional Period—Fishtail Tradition

Orient Type Fishtail Points—147 (Fig. 7 A)			
Lithic preference			
Flint	63		
Jasper	44		
Chert	20		
Siltstone	20		
Fishtail Knives, Flint		9	(Fig. 7 H-K)
Fishtail Drills, Flint		8	(Fig. 7 B-F)
Fishtail Scrapers, Flint		2	(Fig. 7 G, R)

Transitional Period—Broadspear Tradition

Susquehanna—1			
Lithic preference			
Chert	1		
Perkiomen Points—23 (Fig. 6 C)			
Lithic preference			
Jasper	22		
Chert	1		
Perkiomen Knives, Jasper		2	(Fig. 6 K)
Perkiomen Scrapers, Jasper		2	(Fig. 6 I)
Perkiomen Gravers, Jasper		3	(Fig. 6 G, H, J)
Perkiomen Drills, Jasper		4	(Fig. 6 D-F)

Terminal Late Archaic—Broadspear Tradition

Lehigh/Snook Kill		9	(Fig. 6 B)
Lithic preference			
Jasper	5		
Flint	4		
Koens-Crispin, Argillite		13	(Fig. 6 A)

Untyped Broad-Bladed Points or Knives—10

This category includes one large, broad, boldly percussion-flaked slate point. The tip is acutely pointed, the sides are straight to slightly incurvate. Shoulders are rounded and merge with a straight, unconstricted stem. Five broad-bladed implements which can be classified as knives, projectile points, or preforms, depending upon individual inclination, were found in Levels C to F. All are boldly flaked, semi-lozenge in shape, and somewhat less than twice as long as wide. Blades are in the form of equilateral triangles with straight to moderately recurvate edges. The shoulders form an obtuse angle with the slightly constricted stem. The remaining four specimens are broad and rather flat to slightly biconvex in cross section. Stems are broad and rectangular.

Delaware Valley Archaic Complex

Lackawaxen, Shale	3
Untyped, Lobate-stemmed, Siltstone	14

Late Archaic

Normanskill, Flint	3
Vosburg, Flint	1
Brewerton Side-Notched, Flint	1

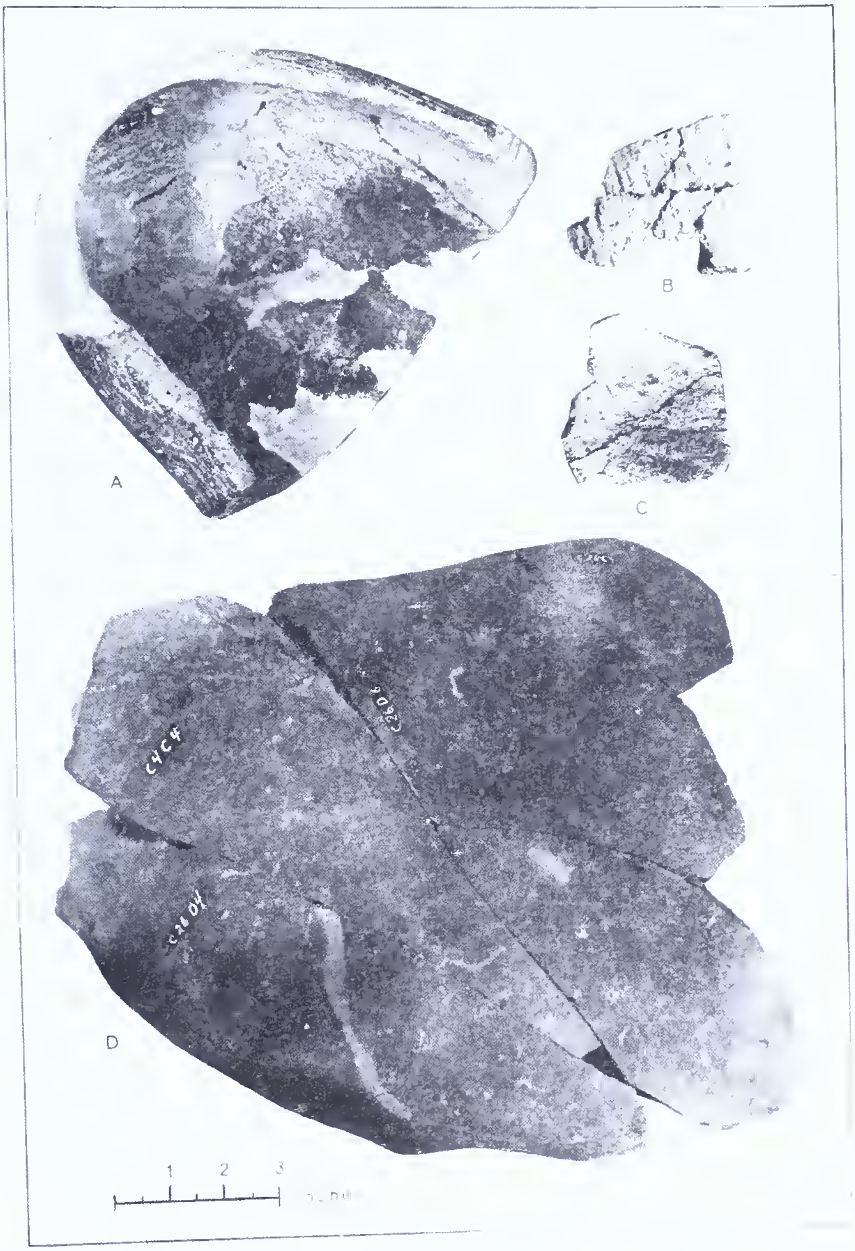

Fig. 9. ARTIFACTS OF THE TRANSITIONAL PERIOD from the Miller Field site: A, reused half of an Orient-style steatite bowl; B, fragment of a steatite bowl showing chisel-marked exterior, Perkiomen component; C, scoop or ladle made from a fragment of steatite bowl, Perkiomen component; D, shattered milling stone, Orient component.

Other Untyped Points—6

These are straight-stemmed points with blades either broken or so excessively resharpened that they no longer present a diagnostic configuration. All are made of flint.

Chipped Flake Implements

Late Woodland Component

Knives from Retouched Flakes	4	
Drills or Gravers on Flakes	3	
Strike-a-lights	5	
Preforms or Possibly Knives	12	

Perkiomen and Fishtail Components

Utilized Flakes		
Snub Nose Scrapers	2	(Fig. 7 N)
Side Scrapers	8	(Fig. 6 N-P)
Concave Scrapers	3	(Fig. 7 M, O)
Scraper-Graver	1	(Fig. 6 M)
Flake Knives	4	(Fig. 7 P, Q)
Flake Chisel Bit (?)	1	
Bifacially Chipped Implements		
Knives	4	(Fig. 7 T)
Bipointed Flakes	7	(Fig. 7 S)
Strike-a-light	1	
Total	31	

Until recently, utilized flakes had not been recognized in association with artifacts of Orient or Perkiomen cultures. Two utilized flake side scrapers were found on the Brodhead-Heller site (McNett 1967: 27-31). However, the Miller Field site was especially productive of these implement types, which were found with both Perkiomen and Orient associations (Kraft 1970: 76-81).

The total sample of projectiles, knives, scrapers, drills, and other chipped implements from all components given above is 477.

Heavy Chipped Implements

Late Woodland Component

Teshoas	135	
Teshoa Cores	7	
Hoes	6	
Choppers (bifaces)	13	
Notched Flat Pebble Netsinkers	45	
Notched Trimmed Netsinkers	37	
Large, Thin, Notched and Trimmed Implements	33	
Unnotched Trimmed Disks	1	

Orient and Perkiomen Components

Celts and/or Adzes	9	(Fig. 8 G)
Notched Flat Pebble Netsinkers	2	

Choppers	4
Trimmed Sandstone Scraper	1

Teshoas (Kraft 1966a; Eyman 1968) were among the most common domestic implements found on the Miller Field site, and they have proved to be very common on many Late Woodland sites in the Upper Delaware River valley, although they are frequently overlooked.

Teshoas are large flakes removed by percussion from river cobbles. They were employed, generally without secondary chipping, as knives, scrapers, or choppers depending on how they were held in the hand and how pressure was applied. Teshoas were apparently "disposable tools" that were discarded when they became dull. Only rarely is the edge rechipped for further service. Occasionally large teshoas were side notched for use as hoes, and a very few show service as whetstones.

Three distinct types of netsinkers were found. A variety made of sandstone or other river pebble material has bifacially chipped or pecked notches on opposite sides. This form accounted for 45 sinkers. Thirty-seven specimens were made from relatively flat pebbles or laminae, notched and carefully chipped into rectangular or oval shape. A third form, which may or may not be a netsinker, is large, carefully chipped, quite thin, and fragile. In shape it resembles a flat or ovoid plate with edges neatly chipped on both sides and then dulled, and with notches for suspension or attachment. Such implements are generally found in cache pits, often stacked like pancakes. One cache contained 18 and another 13. These artifacts have been identified as netsinkers by some authors, and as hoes or pot lids by others (Wren 1914: 84). Their actual use is uncertain. They seem too fragile for hoes and too light and too carefully fashioned to be netsinkers. Elsewhere in this text Werner has referred to these as trimmed sinkers and Kinsey as notched and trimmed implements.

Hoes and choppers are simple affairs. An appropriately shaped cobblestone or teshoa-like flake was bifacially trimmed to produce a proper outline and serviceable edge.

Five celts and/or adzes were found in close association with artifacts of the Perkiomen component and four probably belong to the Orient component. Two of the Perkiomen-associated implements were complete (Fig. 8 F, G), five were missing only the bit portions, one consisted only of a bit, and one was deliberately broken into fragments by percussion. All were chipped into shape; four were polished partially or entirely. Each specimen is biconvex in cross section and has its sides formed by the intersection of the two faces. The four polished celts have sides rounded through grinding. Bits are straight to slightly convex showing striations running parallel to the edge, which indicates that they were honed from side to side across the bit. The majority of these artifacts are rectangular or oval. The finest specimen (Fig. 8 F) was an entirely polished, pointed poll celt or biconvex adze that was found heat-shattered and scattered throughout Pit C-F42. This pit, which also held five Perkiomen points and a Koens-Crispin point, has been radiocarbon dated at 1720 B.C. ± 120 years. The chipped celt (Fig. 8 G) was found in two sections in the same square into which the above mentioned pit was dug.

Two notched flat-pebble netsinkers, not unlike those of the Late Woodland period, were found in an Orient context in Level C. The choppers were generally simple affairs consisting of flat sandstone cobbles bifacially flaked on two or three sides. The trimmed sandstone scraper consisted of a teshoa-like sandstone flake with unmistakable perpendicular striations running across the edge. It probably belongs to the Orient component.

Ground and Pecked		
Late Woodland Component		
Awl Sharpeners	4	(Fig. 7 SS, TT)
Celts	14	(Fig. 8 D, E, H)
Elongated Pebble Chisels	16	(Fig. 7 RR)
Elongated Pebble Awl or Perforator	1	
Ground Geode Cups	3	
Pendants	6	(Fig. 7 UU, VV; Fig. 8 A)
Pestles	9	
Orient Component		
Notched Steatite Bead	1	(Fig. 7 L)
Perkiomen Component		
Spearthrower Weights	3	(Fig. 8 I, J)
Ground Celts/Adze	2	(Fig. 8 F)

The celt is the most conspicuous polished implement of the Late Woodland period on the Miller Field site. Four types of Late Woodland celts occurred. The finest of these are rectangular in outline and octagonal in cross section (Fig. 8 E). These celts are chipped into shape and intensively polished. In all cases the bits are transversely honed. The only triangular celt is clearly pecked and polished; it has rounded sides and a pointed poll and is thicker than the rectangular variety. The remaining celts are oval or triangular.

Of special interest is the fact that celts were often employed as multipurpose tools. Two celts have functional bits, yet the polls are bifacially ground into chisels, and the sides and faces are heavily striated from use as whetstones. The whetting action was so severe in some cases that the sides of the artifacts are deeply corrugated and beveled at an angle of almost 45 degrees (Fig. 8 D).

Sixteen chisels fashioned from elongated river pebbles have bits that are honed from side to side like the celts. The body of the chisel normally consists of unmodified pebble surface (Fig. 7 RR), but an attempt was made to square off the face and sides of two of these pebble chisels.

One elongated pebble has ground facets extending completely around one end and converging to a point that produced what appears to be an awl-like perforator.

Pestles are of the cylindrical or roller type, pecked and ground from sandstone or river cobbles. Seven broken and two entire specimens were found. The majority are 1.5 inches in diameter and were probably less than 12 inches long. One broken pestle measured 3 inches in width and 11 inches in length, and originally must have been considerably longer. It is likely that large cylindrical pestles were employed in deep wooden mortars since stone mortars are unknown in this area.

Four unusual boat-shaped implements were discovered. They seem to have been fashioned from the ends of broad, flat river pebbles. The broken edge is smoothed and grooved to a depth of about .5 of an inch. These artifacts are from 1.5 to 2.0 inches long. One such artifact was deliberately ground into a dugout shape and perforated for suspension (Fig. 7 SS, TT). The striations within these depressions suggest a use as awl-sharpeners.

Three shallow cups made from geodes with their broken edges ground flat were found in silo-shaped pits. The natural concavity in the geode suggests its possible use as a shallow receptacle for pigments or other substances.

Pendants are of three types: oval, triangular, or trapezoidal. Some have serrated edges, others are simply flaked into shape having only the peripheral edges smoothed, and a few are ground overall. The perforations are bifacially drilled. One steatite pendant, 1.5 inches long and .75 of an inch wide, has a rude face carved into it (Fig. 13 B). Curiously, the perforation is at the neck, so the head hangs upside down if suspended from a necklace. In this position the face on the pendant looks toward the person wearing it. Another exceptional effigy pendant or maskette is made from a fine siltstone. It is oval and measures 1.5 inches in both length and width. The manner in which it is carved suggests the braided cornhusk mask or "bushy-head" still used in Iroquois ritualism (Fig. 13 A). It too is perforated at the neck.

Two of the spearthrower weights are flat, simple winged forms with notches on opposite sides of the centrum (Fig. 8 I). The remaining specimen is a broken, drilled, winged type (Fig. 8 J). One notched type is made of gray slate, the others are of red shale. The entire spearthrower weight was found in a Late Woodland pit where it is assumed to be out of context. The drilled specimen and the other notched spearthrower weight were found in Level E some distance from each other. The drilled spearthrower weight had both Perkiomen and fishtail points in the immediate area, but the notched form was found close to Pit 7, presumably associated with the Perkiomen component. Both the notched (Fig. 8 I, J) and drilled spearthrower weights have deep parallel striae extending from the centrum to the wing tips. These may represent ornamentation.

Implements Altered by Usage

Late Woodland Component

Anvil Stones		9
Bi-pitted Stones		5
Elongated Pebble Tools		123
End and Side Abraded	23	
Whetstones	8	
Other Elongated Pebble Tools	92	
Hammerstones		17
Milling Stones		7
Mullers		25
Simple Mullers	12	
Pitted Mullers	8	
Muller, Anvil Combinations	5	
Shaft Smoothers		1
Whetstones		9

Transitional—Orient and Perkiomen Components

Anvil Stones		8	
Bi-pitted Stones		5	
Unifacially Pitted Stones		2	
Hammerstones		9	
Simple Hammerstones	6		
Faceted Hammerstones	2		
Spherical Hammerstone	1		
Milling Stones		7	(Fig. 9 D)
Mullers		7	
Simple Mullers	4		
Pitted Mullers	3		

Pot Boilers		57
Rattlestones	(?)	15
Whetstones		2

Anvil stones were common. A few had the cortex of one or both faces extensively scarred. Others showed only irregular abrasion. The random and ragged scarring on some anvil stones is precisely the type of erosion that results from the percussion flaking of teshoas, as we were able to demonstrate experimentally. Other scarification of the anvil's surface may have resulted from the splitting of bones for marrow extraction, and still others having more broadly exfoliated surfaces may attest to the crushing of roasted quartz, granite, and other forms of grit intended for the tempering of pottery.

As might be expected, pitted and abraded implements were relatively common on the site. Hammerstones are generally nothing more than river cobbles or sandstone pebbles abraded on one or more sides. No flint or jasper hammerstones were found.

Milling stones or shallow mortars consisted of sandstone slabs, or flat, fine-grained cobbles with a shallow concavity marking one side of the stone. For two examples both sides gave evidence of such grinding. The muller, which was presumably used in conjunction with the milling stone, consists of a cobble with one side flattened from prolonged grinding or pulverization. Two of the mullers had pits pecked into the center of the grinding surface. It may be speculated that this facilitated the tumbling of the grain, nuts, or seeds in the process of pulverization. Some mullers showed battered edges similar to those on hammerstones; these may have been combination tools. Only one shaft smoother was recovered on the Miller Field site. This consisted of a sandstone boulder with a single groove, one-quarter inch deep, extending across one curved side.

Elongated pebble tools (Kraft, 1966a, b) were a very common item in pits of the Late Woodland components. As their name implies, these tools are made from elongated river pebbles. Because the knoll and surrounding area were silt deposited and devoid of any pebbles except at a depth of 10 feet (see pages 2-3), it seems reasonable to suppose that such elongated pebbles had been deliberately selected and transported to the site by the Indians.

Very little effort was required to fashion such elongated pebbles into tools. The elongated pebble chisel, both single- and double-bitted, and the pebble awl have already been described (page 25). Many of the remaining elongated pebbles were altered through usage.

Twenty-two show evidence of having been employed as abraders or flaking tools (ends and sides are battered in such cases). Seven elongated pebbles were clearly used as whetstones. Striations in such cases ran either across the face, off the ends, or along and across the sides.

Many of the elongated pebbles have no visible evidence of wear or modification. It would have been a simple matter to discard these as non-utilized pebbles, except for the fact that they apparently were collected and transported to the site by the Indians. Many have a "pulled out" or thinned cylindrical end terminating in a blunt or rounded tip, and a grip or handle end that is somewhat thicker and sometimes knobbed. Of the 55 specimens, 36 were broken across the middle precisely at the point where thumb pressure would have been exerted. Both halves of such broken elongated pebbles were often found in the same pit. The fact that no abrasions or striations are evident on some of these elongated pebbles may suggest possible use in working leather, bark, grass, or other non-abrasive substances.

The anvil stones and hammerstones of the deeper Orient and Perkiomen components are not unlike those of the Late Woodland component described above. Some of the milling stones differ, however, in that the nether side is boldly flaked. It is possible that this practice reduced the carrying weight of the milling stone, a decided advantage for migratory people, and at the same time it gave the milling stone a "grab" on the floor while food was being ground. Seven milling stones as well as mullers were found in both the Orient and Perkiomen levels of the Miller Field site. This is significant in view of the fact that in the past no milling stones or grinding devices of any type have been reported for the Orient, Frost Island, or Perkiomen cultures, and it was believed that such implements were not a part of these complexes (Ritchie 1959: 47).

Fifty-seven pebbles averaging in size from .75 to 2.5 inches were found in clusters near hearths in the C, E, and G levels. Twelve were found near Hearth 11. Fourteen were located on one side of Hearth 12, while another group of 31 pebbles was found on the opposite side. Many are carbon-encrusted, discolored from heat, and have an exfoliated cortex. The thermal alteration on many of these otherwise natural river pebbles, and their association in tight clusters close to hearths suggest that they may have been used in hot-rock cooking.

Fifteen selected pebbles ranging in size from .4 to .75 of an inch in length and .3 to .6 of an inch in width were found in a tight cluster in the Orient level. These pebbles are obviously too tiny for cooking, and because the silted knoll was generally devoid of pebbles, it might be conjectured that these pebbles may once have been enclosed within a turtle shell, gourd, or hide rattle. Ritchie noted a similar occurrence at the Orient No. 2 site on Long Island (Ritchie 1965a: 173; 1969a: 174-5).

BONE AND ANTLER TOOLS

Antler Flaking Tools	2

One of the most serious and perplexing conditions differentiating the Late Woodland period in New York state from that in the Upper Delaware Valley area is the fact that bone and antler implements are rare on New Jersey sites, whereas they appear to be common in New York. Acidity may account for the disintegration and loss of some bone and antler artifacts, but this factor alone cannot account for the scarcity. Bone and antler detritus and skeletal material is preserved, though poorly, in refuse pits and graves, and it would seem that more evidence would present itself if bone or antler had been commonly employed as tools or weapons. Bone awls, bodkins, harpoons, fishhooks, beads, phalangeal cones, arrowpoints, and similar artifacts occurring in the New York state Owasco and Iroquoian cultures simply have not been found here on the Miller Field site or on sites in the Delaware Water Gap area. Two antler flaking tools with battered tips, scarified bottoms, and knife-scraped sides were the only tools of this material. These were found in separate refuse pits with an abundance of cracked deer bones. Antler bases, often quite huge, have also been found in a number of pits, but they appear not to have been worked into tools.

SUMMARY AND CONCLUSIONS

DELAWARE VALLEY ARCHAIC COMPLEX

The Archaic stages are poorly represented on the Miller Field site. It is possible that in early times the land may not have had the same ecological or topographical appeal that it obviously had later, or the evidence may be deeply buried under silt. The lowest levels of the excavations (21 to 27 inches b.p.s.) yielded 14 excessively leached lobate or leaf-shaped points, except for two oval knives there were no other associated artifacts that could help to identify a cultural provenience. The Lackawaxen points, the Brewerton Side-Notched point, and the Vosburg point were similarly out of context, and so too were the three Normanskill points.

Conclusions explaining the presence of these various projectile point types on the Miller Field site would be purely speculative. All of these types have been found on other sites in the area, but no report has yet detailed their relative numbers or their context at sites in New Jersey.

BROADSPEAR TRADITION—KOENS-CRISPIN COMPONENT

The lack of radiocarbon dates from southern New Jersey and the Delmarva Peninsula makes it impossible presently to determine the source of the Koens-Crispin phase. The projectile points of this phase are distinctive and are common in central and southern New Jersey, and south to Virginia and the Carolinas, where they merge with or derive from the Savannah River Stemmed points radiocarbon dated at 1944 B.C. ± 250 years (Coe 1964: 45, 118). The northern distribution is less well known, though specimens have been collected in New Jersey from Monmouth, Somerset, Passaic, and Middlesex counties, from the Raritan and Millstone River drainage systems, and on western Staten Island. Thirteen diagnostic specimens were excavated on the Miller Field site. One such projectile point found in Pit 4 was associated with charcoal that was subsequently radiocarbon dated to 1720 B.C. ± 120 years (Y-2587). The Koens-Crispin component may possibly be even older since this point may be out of context in what is otherwise a Perkiomen pit (see pages 10-1). The early date of this Koens-Crispin point, and the general similarity of form among the Koens-Crispin, Lehigh, and Snook Kill points raise the further question (Kraft 1970: 58-9) of whether the Koens-Crispin point might not have been the prototype for the Lehigh point, which has been radiocarbon dated at 1720 B.C. ± 100 years (Kinsey 1968) and for the Snook Kill point at 1470 B.C. ± 100 years (Ritchie 1965a: 140; 1969a: 142). The configuration of the three point types is essentially the same, though the contour details on the flint and jasper Lehigh and Snook Kill points are usually crisper than those of the normally argillaceous Koens-Crispin points. This is especially true where the argillite has deteriorated because of soil conditions. Many of the Snook Kill points that Ritchie illustrates from the Weir site (Ritchie 1969a: Pl. 49) have apparent counterparts on the Miller Field and at the Koens-Crispin-type station. Future research may help to validate this conjecture.

The lack of deep stratigraphy and the fact that the Koens-Crispin component impinges upon the Perkiomen component makes it hazardous to attempt a delimitation of associated artifacts. The handled knife (Fig. 7 T) and the bipointed implements (Fig. 7 S) are made of the same Triassic Lackatong argillite as the Koens-Crispin points. However, this fact is insufficient to postulate a temporal or cultural relationship because a number of triangular points and three Rossville points of obviously later provenance are made of similar material. Likewise, it is noted that few of the cobblestone tools, milling stones, or mullers can be positively attributed to this component.

Broadspear Tradition—Perkiomen Component

The Perkiomen culture was at home in the Upper Delaware River valley and for a considerable radius beyond. Its origins are obscure, though it is suggested that it developed regionally out of a widespread eastern Late Archaic broadspear tradition such as the Savannah River tradition. More specifically this culture may have derived from the Koens-Crispin/Lehigh phases.

The Perkiomen people had a predilection for fine stone, usually Pennsylvania jaspers. Every Perkiomen point found on the Miller Field site is fashioned from brown jasper, except one which is of chalcedony. The spears or knives were apparently quite large to begin with and were frequently resharpened and reformed. Broken points were seldom discarded as long as the base was intact. The points or ends were often retouched bifacially to form different tools: knives (Fig. 6 K), scrapers (Fig. 6 I)—and at times a fine graver tip was even isolated from the blade (Fig. 6, G, H, J). Drills or reamers were sometimes made from broken or excessively resharpened blades, but the exquisite cruciform drills (Fig. 6 D-F) appear to have been separately conceived. Aside from repair holes drilled into steatite pots and into steatite beads, nothing has survived to indicate the purpose for which these elongated drills were employed. It is of course also possible that the exceptionally long and slender types were not intended as drills, but served some other use.

The large, naturally sharp percussion flakes removed in the process of point manufacture were often used as knives without further modification. This is evident from the crushed edges found on some flakes. The Miller Field site was especially rich, however, in deliberately modified utilized flake tools (Fig. 6 M-P; Fig. 7 M-Q).

Spearthrower weights are of two types, the drilled, and the notched forms with simple wings. One of the notched types (Fig. 8 I) was found in proximity to Pit 7, presumed to be associated with the

Perkiomen component. The drilled specimen was found in an area that yielded both Perkiomen and Orient points; the latter association is, therefore, somewhat uncertain.

Domestic activity is indicated by milling stones and mullers. The treatment that makes these milling stones unique has already been discussed. Several simple mullers as well as pitted mullers were also found. Anvil stones and hammerstones were relatively common in the Perkiomen component. Such implements doubtless found wide use in activities such as cracking nuts and in breaking open bones to extract the marrow.

Cooking was presumably carried out with hot rocks as well as with steatite vessels that could be placed directly over the fire. Several areas of the excavation produced clusters of river pebbles close by hearths. Some of the pebbles had scaled-off surfaces, many showed heat discoloration, and some still had charred organic matter adhering. An obviously better way to cook was to place the food in a pot that could be positioned directly into or over the fire. The Perkiomen people had fireproof pots made from steatite or amphibole talc. Most of these are flat-bottomed and more or less unfinished on the outside. Lugs or ears at each end provided a hand-hold whereby the pot and its contents could be placed on or removed from the hearth. Ritchie found similar steatite vessels associated with the later Frost Island phase (Ritchie 1969a: Pl. 52).

What these people cooked is something of a question. As we have already pointed out, the acidity of the soil is so great as to have completely decomposed all organic vestiges. The only vegetal material found in the excavation were charred hickory nuts from Pit 4; calcined bone chips were also observed, but these were so tiny and so infrequent that it is impossible to make a judgment concerning the animal or human form they might once have had.

Stone bowls were frequently roughed out at the quarry and later shaped into serviceable pots. Some of the celts or adzes found in the area may have served the latter purpose, but they suggest woodworking as well. The fact that nine celts or adzes were located in a rather circumscribed area suggests considerable craft specialization. But no actual evidence of such craftwork other than stone bowls and lithic tools has survived.

Life on a campsite located between the Delaware River and Vancampens Brook must have suggested the utilization of some sort of food derived from the river; sturgeon, shad, eel or the like, and freshwater mollusk, but only two netsinkers, could be attributed to the Perkiomen or Orient components. This does not rule out the possibility that these people made fish weirs or used nets; the netsinkers may be deposited closer to the river or outside our area of excavation. The nearby Vancampens Brook may at that time have presented a different ecological environment than it does today. Beaver occasionally dammed up the brook causing it to back up and flood out the lowlands around the knoll. A considerable lake or marsh would have resulted from such an effort, and numerous forms of animals would be drawn to the area.

No evidence of dress or ornament has presented itself in our excavations. Witthoft (1953: 12) has pointed out that beads and gorgets are often cut from broken steatite kettles. Gorgets were absent from the area as were doughnut-shaped beads. A notched steatite bead (Fig. 7 L) was found, but the context and surface finish suggest a more appropriate association with the Orient fishtail component. Portions of four gorgets were found by Staats a short distance from our excavations, but none was made of steatite.

The fact that the Perkiomen component at the Miller Field site has been radiocarbon dated to 1720 B.C. ± 120 years, and 1640 B.C. ± 100 years has been previously noted. The implications of these dates are quite clear; the Perkiomen phase is antecedent to the Frost Island phase of central New York as Ritchie correctly surmises (Ritchie 1965a: 162; 1969a: 163-4). Moreover, the Miller Field site has provided the earliest dates for the Perkiomen phase as well as a full artifact inventory which assists in the reconstruction of this culture.

FISHTAIL TRADITION—ORIENT COMPONENT

Heretofore, the Orient phase of the fishtail tradition was best known through the writings of Ritchie (1959, 1965a: 149-77). Witthoft described the distinctive fishtail point as a Transitional period projectile point (Witthoft 1953: 23), but the culture to which it pertained was rather enigmatic, so much so that Ritchie assumes it to be an essentially Long Island manifestation with some spillover into adjacent states.

The Miller Field site and other local sites have shown that the fishtail tradition is far more extensive than was once believed and that Long Island was the recipient of an already mature and fully developed Orient culture that came by way of the Upper Delaware Valley. Almost everything (except cremation burials) associated with the

Orient phase on Long Island sites has been found on the Miller Field site, and some of the artifacts found in the Delaware Valley were not previously associated with the Orient phase.

It is uncertain from the evidence on the Miller Field site that the fishtail points were actually employed as spears or javelins propelled by means of an atlatl or spearthrower. It has already been noted that three spearthrower weights or bannerstones were found in the deeper levels of the site. The notched, simple winged form (Fig. 8 I) was found in a Perkiomen context. The drilled spearthrower, however, was associated with both Perkiomen and fishtail points and its position is consequently more ambiguous. Kinsey, however, found a spearthrower weight in association with the Orient component at the Faucett site, and Ritchie reports finding one at the Jamesport site. Ritchie (1959: 61) also notes that a short tubular bannerstone was found at the Orient No. 2 cemetery on Long Island.

Morphologically we were able to separate two types of fishtail points, an elongated type and a shortened type. Whether this distinction existed in the mind of the aboriginal flint-knapper is a moot question, however. The former is decidedly more gracile and may have represented the ideal construct. The shortened fishtail form may represent points that have been resharpened or repointed.

The various tools derived from the fishtail point are of great interest in assessing the lifeways of these people. Except for an occasional fishtail-based drill and a strike-a-light, such derivative implements were unreported heretofore. It is difficult to determine whether these implements (Fig. 7 B-K) were deliberately made in this form, or whether they represent a modification of a previously existing projectile point. The fishtail knife, Type 1 (Fig 7 H, I), has many of the characteristics of a paring knife: a keen point, a flat back upon which thumb pressure might be exerted, and a blade set at a very acute angle. The more or less excurvate fishtail knife, Type 2 (Fig. 7, J, K), has similar characteristics, but appears to be generally less well designed.

Drills with fishtail bases were quite numerous on the Miller Field site, and they fall into two separate categories. In some instances an actual projectile point was pressed into service; the wear evidence is indicated by a thorough polishing and rounding of the point. Others have sides which were deliberately constricted to produce a narrower bit (Fig. 7 B-F). Such drills may have been used to drill mending holes into steatite bowls. Gorgets and steatite beads were similarly drilled, and it seems reasonable to expect that these drills were used for many other purposes as well. The location of 10 fishtail drills in a relatively small excavated area suggests a rather intensive use. Wooden implements must have had wide use among the Orient people, and holes might have been drilled into these for purposes of suspension, or in order to join one piece to another. Regrettably, nothing has survived to substantiate this conjecture.

Two fishtail scrapers have come from the excavations. These, like the Perkiomen scrapers, were bifacially trimmed across the blade in one case, and very delicately across the base in the second case. They might simply represent two instances of broken points pressed into scraper service. Utilized flake scrapers of convex, concave, and specialized design were also distributed throughout the area (Fig. 6 O, P; Fig. 7 M-Q). With possibly one exception, utilized flake implements were not encountered on Long Island (Ritchie 1959: Pl. 22, No. 18).

The people who made and used the fishtail spearpoint cooked their food in much the same way as did the Perkiomen people. They seem, however, to have favored a more or less oval, round-bottomed steatite vessel from which all traces of the quarry pick or chisel were smoothed away. Lugs at the ends of the pot facilitated the carrying of the pot and its contents. Steatite pots represented an enormous labor. A suitable pot had to be roughed out at the quarry, possibly 100 miles or more away from the site (Harlan Mills Quarry in London Brittain Township, Cecil County, Maryland, or the Christiana quarries in Lancaster County, Pennsylvania, seem to be the nearest known sources of really good steatite). Then the pot had to be suitably hollowed out, the lugs had to be isolated, and decorations, where desired, had to be added. The latter work could have been done at the camp. Pots were probably highly prized and salvaged whenever possible. When a crack developed, holes were drilled into the steatite on opposite sides of the fracture, and the pieces were laced together again. Occasionally, however, a bowl would separate completely. At such times a sizeable half-portion would be saved, the fractured ends would be rounded, and the scoop-like remnant continued in use.

Reused half-bowls of steatite were found at the Jamesport and Sugar Loaf Hill sites on Long Island (Ritchie 1959: 65, 74), at the Raccoon Creek site in Salem County, New Jersey (Kier and Calverley 1957: 85), and at the Miller Field site (Fig. 9 A). That these bowls continued in use is attested to by the fact that charred organic matter still adheres to the bottom and edges of the reused half-bowl. When steatite or talc bowls were beyond repair the resultant fragments were occasionally formed into gorgets or beads. One unusual steatite bead, notched instead of drilled, was found in association with fishtail points (Fig. 7 L). A similar bead was found on the Lackawaxen site in Pike County, Pennsylvania (Leslie August 14, 1969: personal correspondence).

Steatite bowls are part of a mortuary complex on Long Island. The Miller Field site also provides some evidence for a possible mortuary complex consisting of four horseshoe-shaped ovals of fire-cracked stone. No evidence of bone remained, nor were there any grave offerings in the immediate surroundings, except for a few lumps of red ochre. However, an analysis of the soil by Toth demonstrated a higher trace of phosphate and calcium than was normal for the area. A postmold pattern about nine inches above the horseshoe-shaped configurations suggested a superstructure, possibly a charnel house or memorial structure, which would be unique for the Orient phase if these postulated reconstructions are valid (Kraft 1970: 47-51).

Numerous small fire pits and refuse pits can be associated with the fishtail component, and hearths are an important part of this culture. Some of the hearths consisted simply of a mass of river cobbles atop the living floor. These hearths might be from two feet to six feet in diameter. Hearth 3, Feature A-F36, 15 feet long and 8 feet in width, may possibly have been a food-drying or food-smoking area. Other hearths appear to have been superimposed upon shallow pits. In most of these fireplaces the combustion was so complete that little in the way of charred wood, bone, or vegetal matter survived. Strike-a-lights in the form of flint spalls of Onondaga chert were recovered, but pyrite or limonite were not found.

A number of milling stones were found together with mullers, both simple and pitted. Anvil stones, hammerstones, and possibly teshoas were also found, the latter in the upper levels.

On the basis of the excavated materials and features from the Miller Field site, it is evident that many of the assertions made by Ritchie and others concerning the Orient phase are no longer tenable. For example, the statement that the Orient fishtail point occurs only "sporadically in eastern New Jersey" (Ritchie 1959: 10, 49, 90; 1965a: 164; 1969a: 165) needs to be modified in view of the large numbers of these points occurring in northwestern New Jersey and northeastern Pennsylvania. Similarly the statement that "two secondary sources of dissemination in steatite producing regions can be distinguished, one (the Delmarva Peninsula and southeastern Pennsylvania) . . . giving rise to the Susquehanna Soapstone culture; another . . . in southern New England, to which the Orient stone vessels relate" (Ritchie 1959: 62; 1965a: 161; 1969a: 162) ought to be re-evaluated. The Orient steatite vessels from the Delaware Valley, which exactly duplicate those from Long Island, and which are earlier in time, may as easily have originated from the south. It has been shown that vessels of similar form having smooth exterior finishes have been reported from Virginia to New York. Of particular interest, in this respect, are the steatite vessels from the Minguannon site, Chester County, Pennsylvania, the Raccoon Point site in Salem County, New Jersey, the Abbott Farm site below Trenton, the Trumm and Madison sites on the Millstone River, and the several sites in the Upper Delaware Valley.

It is possible to agree with the statement that the "Orient phase conveys the distinct impression of having achieved its climax on Long Island" (Ritchie 1965a: 173; 1969a: 174), if by "climax" is meant the final flowering and demise. It is no longer "unequivocal that the Orient culture was native to Long Island" (Ritchie 1965a: 164; 1969a: 165) because it has not been demonstrated that there were any antecedent cultures on Long Island from which the Orient focus could have developed, nor is there any such evidence from southern New England (Rouse November 18, 1968: personal correspondence). We have been able, however, to demonstrate such antecedent traditions in the Upper Delaware Valley where the Perkiomen component at the Miller Field site has similar tool forms and steatite bowl prototypes for the later Orient culture and vessels. Similar evidence has recently been found at a site designated 36-Nm-12, a few miles north of Easton, Pennsylvania. Furthermore, the Orient component radiocarbon date of 1220 B.C. ± 120 years (Y-2589) and other dates from similar components in the Upper Delaware Valley are at least 200 years earlier than those from Long Island.

The Introduction of Pottery

Long before the steatite bowl fell into disuse a cultural innovation, pottery, made its appearance on the Miller Field site and on many other sites from the Potomac Valley and Virginia north into the Susquehanna Valley and presumably into central New York. How or where pottery was first introduced into the Northeast is still unknown. It has been recognized that the earliest pottery in the Northeast imitates the general form of the steatite bowls. Even more interesting is the fact that the ware, known as Marcey Creek Plain, is tempered with crushed pieces of broken steatite bowls. The bases of the earliest pottery vessels often show impressions of the mats or fabric upon which they were modeled. In this respect they are somewhat similar to the presumably earlier fiber-tempered wares of the southeastern states. Marcey Creek Plain, however, has no counterpart below Virginia, and so we expect only stimulus diffusion from that direction. The immediate area that appears to have the greatest concentration of these flat-bottomed, steatite-tempered vessels is central and southern New Jersey where the earliest evidence of recovery is recorded (Cross 1941).

Steatite might have recommended itself quite naturally as a temper for this early pottery. It is heat conducting, and most of the crushed steatite so employed was itself once part of a stone cooking vessel. The problem with steatite is that it is soft, breaks easily, and has a more limited distribution than either clay or other tempering agents. Potters undoubtedly experimented with many forms of tempering material, and once it was discovered that crushed quartz, granite, limestone, or even coarse sand produce as good or better results, the technological break with the soapstone prototype vessel was complete. Henceforth all vessels would be fabricated from local clays and tempered with harder grits. The form of the vessels, however, persisted even after grit temper was substituted for steatite. Lug-handled, flat-bottomed vessels, with grit temper and either plain surfaces (Ware Plain) or cord-marked surfaces continued in use. These early vessels normally had lugs attached to the vertical or slightly slanting sides, though some were devoid of these conveniences.

The Miller Field site has yielded examples of these early pottery vessels in the higher subhumus levels. Since the Orient fishtail point was predominant in the squares in which the pottery was found, it is likely that these early pottery types were introduced during late Orient times.

Early and Middle Woodland

The Miller Field site appears to have been sparsely and sporadically occupied from Early through Middle Woodland times. Sizable portions of two Brodhead Net-Marked vessels, and several Vinette I sherds were found in an area that also produced Rossville points of argillite. Hearth 5 (C-F38) near which the net-marked pottery occurred, produced charcoal which yielded a radiocarbon date of 480 B.C. ± 80 years (Y-2590). Point Peninsula pottery, except for the

Vinette I type, is either unrecognizable in the highly fragmented sherds of coil- or fillet-constructed pottery, or is absent. No dentate- or rocker-stamped pottery is known to have occurred on this site. By contrast, the Late Woodland period, from earliest Owasco times through the Historic period, is very well represented.

LATE WOODLAND

Almost all of the late prehistoric and protohistoric manifestations, except for postmolds, pits, and burials, were contained in the disturbed topsoil. This repeatedly plowed humus zone had of course been picked over time and again by relic collectors and so contained only a portion of its original ceramic and lithic holdings. Nevertheless, sufficient artifacts remained, and assuming that the law of chance would hold, it was supposed that at least a random sample of the domestic implements and weaponry could be obtained. The results justified the expectations.

Disregarding the change in triangular points from the equilateral Levanna type to the isosceles Madison type, the most satisfactory way of distinguishing the various Late Woodland components is by means of pottery styles. Using this criterion, the Late Woodland period at the Miller Field site may be separated into the following components: Clemson Island, Owasco, Intermediate, and the Incised Collar Series (Tribal). Certain Susquehannock, Abbott Farm—Overpeck, and Bowman's Brook influences also manifest themselves during this time. To quote Ritchie's (1965a: 272; 1969a: 273) statement about the Owasco culture, every component "represents a developmental continuum through time and space [and] it becomes exceedingly difficult, if not impossible, narrowly and specifically to define and characterize separable and distinctive phases." What is true of pottery is equally true of lithic artifacts.

The mixed Late Woodland situation on the site makes an analysis by components difficult. Refuse pit, hearth, or burial associations are an aid, but judgments based upon such evidence are tenuous. The following evaluations and conclusions, except where otherwise stated, appear to represent developments during the Late Woodland period.

The plow zone was especially productive of chipped artifacts such as arrowpoints, knives, scrapers, drills, perforators, and gravers. The triangular points, which may properly be called arrowheads, are the hallmark of the Owasco and successive cultures (Ritchie 1965a: 275; 1969a: 276). The excavation produced 177 complete or nearly complete triangular points together with 53 discarded and broken specimens. The lengths of these points vary from 2.0 to .75 inches, with the majority at about 1 to 1.5 inches. About 64 per cent of these are of Helderberg or Glenerie Flints (Wray 1948: 38-9) available in local Kittatinny outcroppings. Of the remainder 6 per cent are brown jasper, 2 per cent are slate, 1 per cent argillite, and 27 per cent are of unidentified flints or exotic cherts. In form these projectile points fit the Levanna and Madison descriptions of Ritchie (1961: 31, 33-4). That is, 127 are approximately equilateral triangular points with straight or concave bases, 31 are isosceles triangles with straight or concave bases, and 19 are elongated triangles having concave or "V"-shaped bases. The latter appear to be the most recent, several having been recovered in deep silo-shaped pits that also included European trade items. Whether the spear was still in use at this time is unknown and nothing suggesting a spear tip was found.

Of special interest is the fact that many of the triangular artifacts were used for purposes other than as arrowheads. Five exhibit evidence of having been fastened point-into-handle in order that the sharp base could be used as a scraper (Fig. 7 KK-MM). Three show signs of having served as strike-a-lights (Fig. 7 NN, OO). The tips of five triangular points were skillfully thinned to serve as gravers or perforators, seven had the point worn in a manner indicating use as a reamer, two examples had been rechipped into drills, and one triangular point has wear evidence indicating use as a knife. Such modifications of triangular points have been noted on many sites attributable to Hunter's Home and Owasco manifestations (Ritchie 1965a: 258, 277; 1969a: 260, 277).

The number of fragmentary points found on the site suggests that the hunters untied and discarded broken points upon returning to the village where new arrowheads were refitted to replace those fractured in the chase. However, not all broken points were discarded. Numerous examples clearly show that the hunters salvaged arrowheads by repointing them (Fig. 7 PP, QQ). The evidence seems to suggest that the Indian fashioned a number of triangular points at one time and then cached these in a pouch or other receptacle for later use as arrowheads, knives, scrapers, drills, or strike-a-lights depending upon need. This contention that a number of points were made at a time is supported by the fact that pockets of buried spalls, often containing hundreds of tiny chips, were found at various loci. One pit burial (A-F35) contained 1,161 flint chips, three flint cores, and two unfinished and discarded triangular points in the fill above the interment.

Most triangular points were bifacially chipped from cores, though a few show evidence of having been unifacially chipped from flakes. Large flakes were also employed in the manufacture of knives, scrapers, and gravers. Side scrapers were fashioned from irregular, lamellar, or tabular flakes. Those having their straight sides unifacially trimmed accounted for more than 50 per cent of the utilized flakes attributable to the Late Woodland components. Three types of implements were fashioned from rough spalls. Outstanding among these are five gravers or fine perforators, two steeply retouched thumb-type end scrapers, and a drill.

The considerable number of whole triangular points as well as those showing point-impact fractures attest to the importance of hunting in Late Woodland times. Deer bone is quite abundant despite the acidity of the soil; one Owasco pit contained the remains of at least three deer, judging from frontal bones and jaws. All bones were split open presumably to extract marrow, brains, or whatever juices they contained. Bear remains are very scarce. Evidence of other land animals, with two exceptions, did not survive. One pit provided the carapace of a box turtle, apparently fashioned into a cup or bowl, and the remains of two dogs were found in separate refuse pits. There can be no question that dogs were eaten. The craniums and long bones of both animals were broken open and the remains were haphazardly discarded.

Fishing was of considerable importance judging from the numerous netsinkers found everywhere on the site. Some, like the natural flat pebbles with side notches, are convincingly identified as netsinkers. Why so many of the notched flat stones were bifacially trimmed into rectangular or nearly rectangular shape is more difficult to understand. It is doubtful that the additional time and energy expended in their manufacture would have enhanced their functional value as netsinkers. The large thin notched disks or plates of slate, often about 25 square inches in area and less than one-quarter of an inch thick, are even more puzzling. They not only seem to be too light, but also present too much surface to the current, a condition that might tend to sail the net upward rather than weight it down. Some authors have identified the latter as notched hoes or pot lids, but these explanations raise additional questions concerning the serviceability of shale for such assumed functions.

The Delaware River is rather shallow in places near the Miller Field and thus it provides potential sites where fish weirs could easily have been constructed. Numerous netsinkers have been found along the beach and bank to support this contention. However, no bone or antler fishhooks or harpoons have been found either on this site or on any other site on the New Jersey side north of the Delaware Water Gap. By contrast, the Hunter's Home phase and Owasco sites in New York often have bone, antler, or thorn harpoons or fishhooks (Ritchie 1965a: 256, 277-8; 1969a: 257, 277-9).

Freshwater mussels were gathered in large number, and shell pits containing a bushel or more of these mollusk shells are not uncommon. Fish scales and fish bone are often well preserved in shell pits of Owasco or later times. It should be noted at this time that references are often made to alleged yearly journeys to the ocean in order to collect seafood and shellfish. No archeological evidence exists to support these assertions. With one minor exception, there are no clam, oyster, scallop, or other sea shells at known sites in the Upper Delaware Valley. It is probably unreasonable to expect that the Indians of northwestern New Jersey would have undertaken such a long journey when the Delaware River provided freshwater mollusks in abundance.

Horticulture was well established on the Miller Field site in Owasco and later times. Evidence for this is found in deep basin or silo-shaped pits containing small charred corn cobs between two and three inches long together with charred corn husks and kernels. Other pits yielded beans *(Phaseolus vulgaris)* and squash seeds *(Cucurbito pepo),* the latter having been preserved by association with trade copper. Garden produce was supplemented by foods gathered in field and forest. Charred wild plum seeds and the shell and meat of the butternut, hickory nut, and acorn were likewise found in pits and hearths.

Both domestic and wild foods were presumably ground into flour by means of the flat milling stone and muller. Some foods may also have been placed in wooden mortars and pulverized by means of the cylindrical pestles. Nine pestles were found either in pits or in the Late Woodland strata, but the postulated mortars are gone without a trace.

The soil was evidently cultivated with the aid of hoes made from notched teshoas or trimmed slabs of sandstone. Teshoas (Kraft 1966a, b; Eyman 1968) were used for many other purposes as well. They are among the most common domestic implements found on the

Miller Field site, and have proved to be ubiquitous in the entire Upper Delaware Valley. More than 150 of these disposable tools were located in the plow zone and in pits. Wear evidence indicated that many teshoas served as scrapers while others were used as knives or choppers. Several large teshoas were side-notched, and it is surmised that they were used as hoes or digging implements. Three specimens have only a single broad and well-worn notch; they may have been employed as spokeshaves.

Pitted and abraded implements were relatively common. Hammerstones are generally nothing more than river cobbles or sandstone pebbles abraded on one or more sides. The simple hammerstone is represented by seven specimens. There are also five pitted and six bipitted hammerstones as well as muller-hammerstone combination tools. Anvil stones were also plentiful. A few had the cortex of one or both faces extensively scarred, while others showed only irregular abrasions.

Elongated river pebbles were modified and used for a wide assortment of tools such as chisels, abraders, and whetstones. Some show no discernible wear evidence, but their relatively common distribution throughout the Late Woodland component suggests that they might have been used in some nonabrasive tasks (Kraft 1966a: 5).

The Late Woodland Indians favored the celt as a woodcutting tool, with only one grooved axe found on the site. Axes are quite rare on the local Late Woodland sites in the Upper Delaware Valley. Celts were usually well made from pebble argillite, fine sandstone, or basalt. Some have been very carefully fashioned and ground (Fig. 8 E), others are worked in a more perfunctory manner. One celt (Fig. 8 H) appears to be made from a broken pestle, the bit being very sharply beveled from both sides. This celt was found as part of a grave offering. In size these celts vary from two to seven inches, while the majority are between four and six inches long. Two celts, still of good size and having sharp, functional bits, show severe use as whetstones (Fig. 8 D). If these sharply bitted implements were regularly used as whetstones, then the celt might not have been hafted, and the bit could have been used for purposes other than chopping.

The boat-shaped awl sharpeners, pendants, and other ground implements have already been mentioned (page 25). Remaining, however, are the fossil gastropods, quartz crystals, and oddly shaped and incised stones (Fig. 7 VV). Some of these were found together in one refuse pit. Their association raises the question whether these were

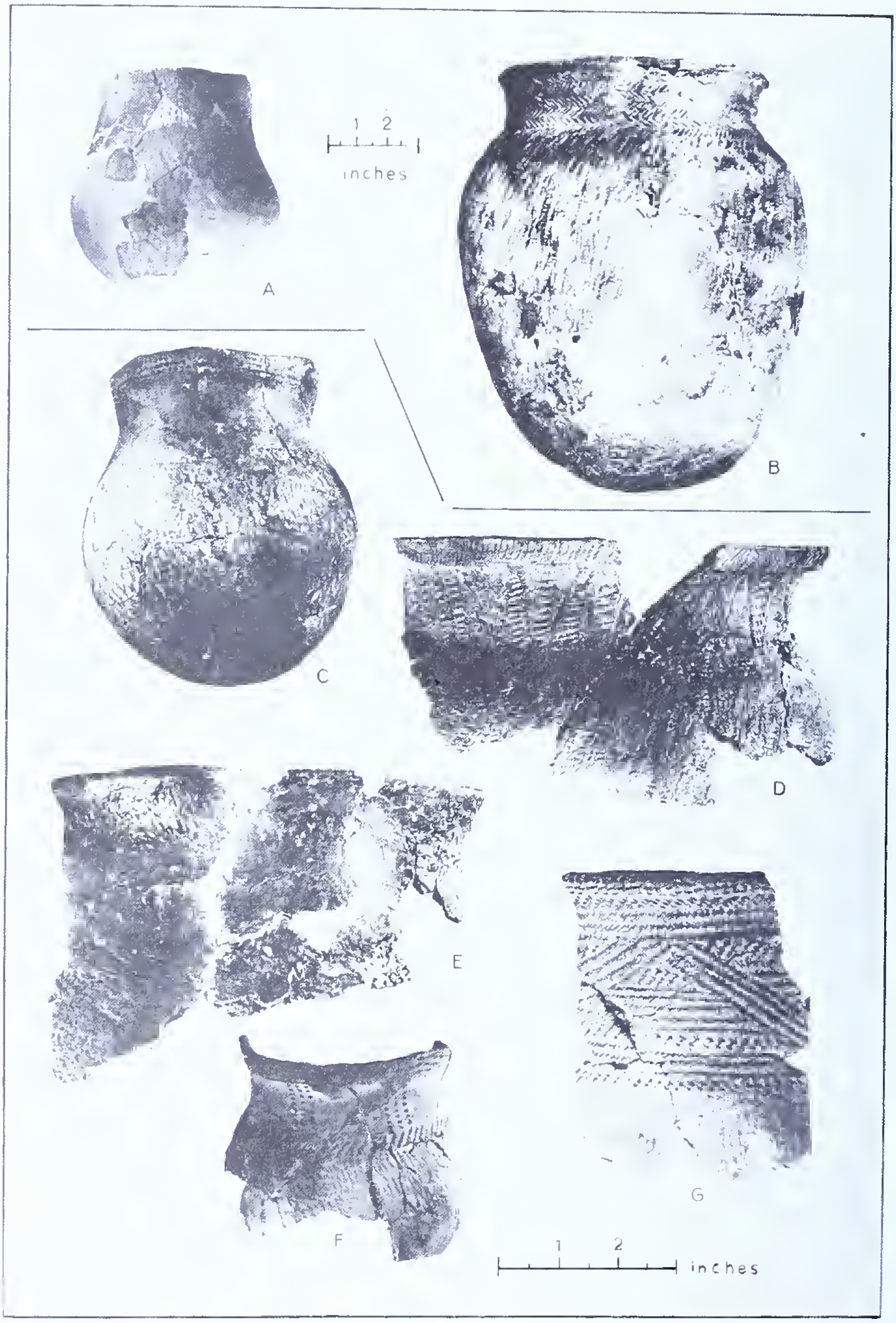

Fig. 10. OWASCO AND INTERMEDIATE SERIES POTTERY from the Miller Field site: A, possible Castle Creek Punctate; B, Sackett Corded (Owasco Herringbone); C, F, Kelso Corded (Owasco Corded Collar); D, G, Owasco variant; E, Canandaigua Plain.

mere "collectors' items" or whether they were part of a decomposed medicine bag.

The Miller Field site has yielded an enormous variety of pottery vessel styles. The attributes of these vessels are treated in the pottery Appendix. One fact is clear, however, the people who occupied the Miller Field site employed ceramic forms and decorative motifs that had a common appeal throughout a wide area of northwestern New Jersey, northeastern Pennsylvania, and far into New York. Nevertheless, the Indians of this area were not slavish imitators, because innovations and variations are easily discernible. Owasco, Mohawk, and Munsee types are patently the majority wares in their respective Late Woodland time periods, while Susquehannock, Overpeck, Bowman's Brook, and Clemson Island wares are but a few of the non-local forms which are present.

The entire Sackett Corded series (Lenig 1965: 6) is abundantly present; the Owasco Corded Horizontal style being most common, followed by Owasco Platted, Owasco Herringbone, and, least commonly, by the Owasco Corded Oblique. One completely reconstructible vessel of the Owasco Herringbone type (Fig. 10 B) was found filled with charcoal. This charcoal was submitted for radiocarbon dating and produced a date of A.D. 1190 ± 100 years (Y-2591). This date seems to indicate that the Owasco occupation might have been earlier in northwestern New Jersey than was heretofore supposed. This date is also coeval with some received from central and eastern New York, where the Owasco culture was first recognized.

Two new Owasco pottery variants are recognized not only on the Miller Field site, but also on the Buckwood Park site, Harry's Farm site, and a number of other New Jersey sites north of the Delaware Water Gap. These new types are herein defined as Owasco Plain and Owasco Incised Neck (page 16). Both types possess the typical Owasco vessel form but differ in decorative motifs. Owasco Plain is very similar to Canandaigua Plain and is presumably early Owasco, while Owasco Incised Neck may be terminal Owasco.

It is difficult to escape the feeling that, at least on the Miller Field site, some Owasco vessel forms continued in style long after the incised, collared vessels had been introduced. The fact that corded, collarless Owasco-like vessels coexisted side by side with incised, collared vessels may suggest (1) that the Owasco vessels were sufficiently durable to last for a long time, or (2) that there were traditionalists here who persisted in the old way of pottery making despite the introduction of collared vessels and new incised decorative techniques. For example, there are numerous applications of Mohawk-inspired filled triangle and complicated triangle, trapezoid, and parallel line decorations, executed in corded-paddle-edge technique on otherwise classic, collarless Owasco corded-bodied vessels (Fig. 10 D, G). Owasco vessels, throughout their tenure, vary in body shape from round to elongated and in volume from about one quart to over five gallons. The Seton Hall University Museum has an Owasco Corded Horizontal vessel from Minisink Island with a capacity of almost 20 gallons (Fig. 110). Numerous pots show repair holes that once served to tie cracks together (Fig. 10 B). Several carefully made vessels of about one-half pint capacity suggest use as cups. Three shot-glass-sized pots were also unearthed. They are carefully molded and possibly were used as herb or condiment containers, or they may have been "toy pots."

The as yet poorly understood Clemson Island pottery type is represented at the Miller Field site by six excavated specimens. All are of generalized, collarless Owasco form with corded designs (usually corded horizontal or platted) and punctates. These punctations are commonly in the form of horizontal bands impressed into the rim from the outside of the vessel leaving raised knobs on the inner rim. At times the punctations are executed from the inside out.

Overpeck Incised pottery and/or Bowman's Brook pottery is often found in deep basin-shaped refuse pits together with Owasco vessels. Such associations occur too often to be mere chance, and it appears that the two distinct vessel forms may have been in contemporary use. The Overpeck and Bowman's Brook forms are not indigenous to the Upper Delaware Valley, but they have been identified on the Bell-Philhower site (Ritchie 1949) and on several other sites suggesting north-south contact or diffusion.

Shell-tempered Susquehannock pottery has been excavated from the site, which together with a distinctive tulip bowl pipe points to yet another source of ceramic or culture influence. Incidentally, granitic grit is the preferred tempering material on the Miller Field and at other local and related sites. The relatively few shell-tempered vessels are imports.

The collared-vessel series begins with Kelso Corded, a type which includes the Owasco Corded Collar, of which there are 30 excavated examples, and Bainbridge Collared Incised, which is scarce. Kelso Corded vessels on the Miller Field site have collars that vary from incipient to pronounced; most are from 1.5 to .75 inches high. Corded-

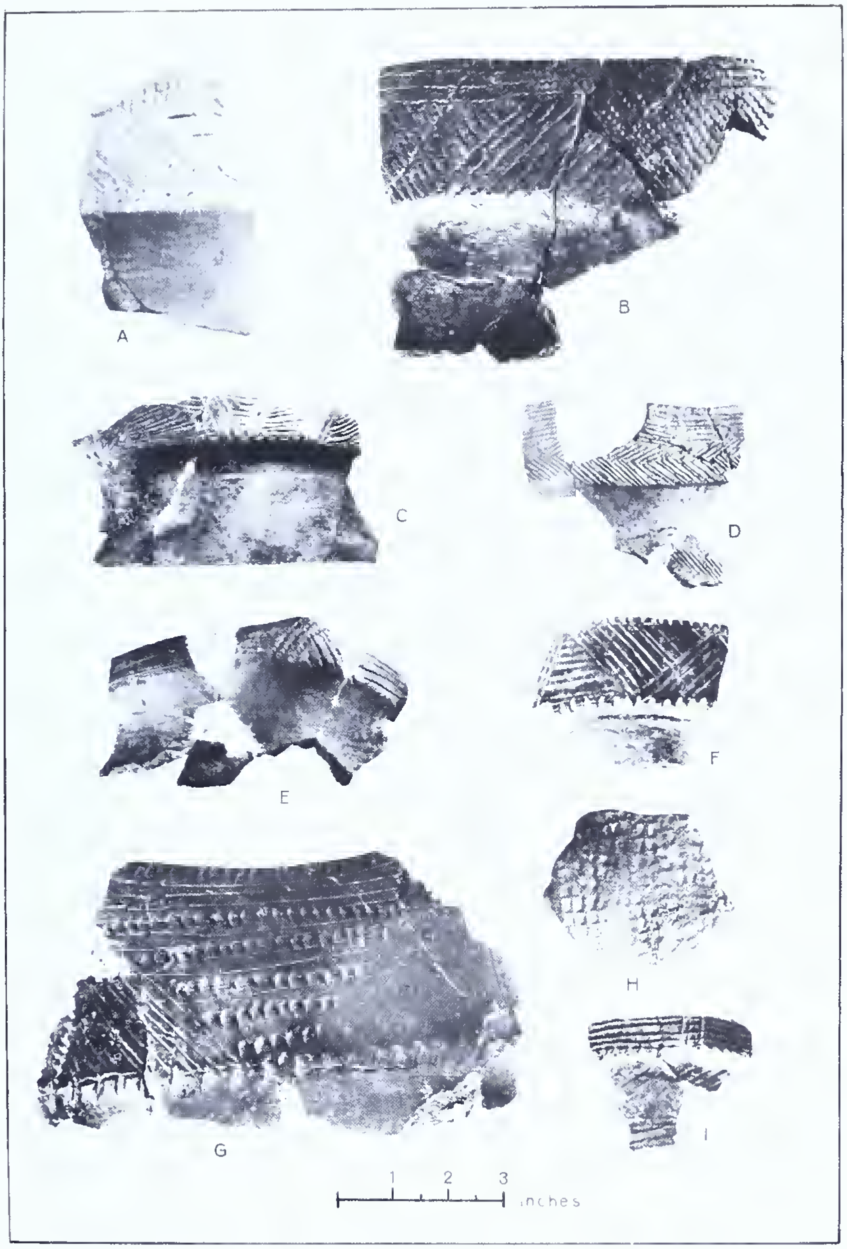

Fig. 11. INCISED COLLAR SERIES POTTERY from the Miller Field site: A, Munsee Incised with effigy face at castellation; B, Oak Hill Corded; C, Deowongo Incised variant with alternating plain and notched elements on lower edge of collar; D, Chance Incised variant with shell temper; E, Kelso Corded variant, with horizontal incised lines combined with corded opposed oblique lines at castellation; F, Deowongo Incised; G, Munsee Incised; H, body sherd showing check-stamped treatment; I, possible Iroquois Linear.

paddle-edge designs consist of horizontal bands sometimes with vertical or oblique lines under low castellations and sometimes with the addition of parallel oblique elements above and/or below the horizontal bands. Variant forms may have the area under the castellations decorated with filled triangles, ladders, or oblique bands (Figs. 10 C, F; 11 E).

Oak Hill Corded is also represented. This differs from the former in that it presages, in corded-paddle-edge technique, the triangles, filled triangles, and horizontal line motifs that are to become the essential design elements on the incised pots from Chance to Munsee times. Curiously, this transition from corded collar to incised collar is not an all-or-nothing affair; occasionally both techniques appear on the same vessel (Fig. 11 E).

Chance Incised pottery is relatively common on the site, but Durfee Underlined is correspondingly scarce. One Chance type vessel (Fig. 11 D) was constructed of shell-tempered ware; all others contained crushed granitic grit. The bodies of the Chance Incised vessels were generally cord-marked, but several examples had carefully check-stamped exteriors (Fig. 11 H). While Chance pottery is normally decorated by means of incising, there are examples where the design was carried out in a sophisticated dentate or in a carefully interrupted linear technique.

Deowongo and Garoga Incised types, as defined by Lenig (1965), are present. There are numerous typical examples, and some specimens show variations on the alternate triangular-horizontal or vertical band motifs. The same is true of Goodyear Lipped and Otstungo Notched types.

Munsee Incised includes medium-to-high-collar vessels. Many incised and punctate-decorated rim sherds include complicated, nested and/or filled triangles, interspersed with, or alternating with, rectangular or trapezoidal elements filled with horizontal, vertical, or oblique parallel lines. Rows of wedge-shaped punctates are often introduced within the principal design elements (Fig. 11 G). Effigy faces are common although they are abstractions consisting of two punctates to represent the eyes and one punctate to represent the mouth. Effigies are usually impressed directly under the castellation (Fig. 11 A). Staats found a clay node that was undoubtedly modeled separately and affixed to a Munsee vessel. One effigy face occurred on a vessel of the Otstungo Notched type. The apparent similarity between Munsee effigy faces on pottery and similar effigy faces on Late Woodland pendants (Fig. 13) may suggest a possible interrelationship with the "Living Solid Face" and the Big House Ceremony (Kraft 1968a; 1969a).

Munsee vessel shapes appear to be distinct types. The earlier, straight, high-collared Munsee type is an obvious outgrowth of the Chance Incised, Garoga Incised, and other Mohawk types. The collar here is a distinct entity and sharply stands away from the body of the vessel as a result of the neck constriction. A later form of Munsee vessel has a broad carefully incised rim, but no constricted neck exists to clearly delimit it from the recurved, subconical body. The rim in this case is fashioned from four insloping rectangular sides that gradually transform the round body to a square mouth. The body is prevailingly smooth but it may be cord-marked.

Pottery tobacco pipes occurring in a variety of shapes and designs were found at the site by Staats and during the Seton Hall University Museum excavations. The finest example superficially resembles the early Iroquois type found at El Rancho, Montgomery County, New York (Ritchie 1965a and 1969a: Pl. 107, No. 3), but Ritchie thinks that the Miller Field specimen may actually be of the Historic period, that is, post-1650 (Ritchie November 26, 1969: personal correspondence). Another example similar in general configuration to our modern pipes was found with a flexed burial together with other grave goods (Fig. 8 B). The remaining pipes vary from very obtuse to nearly right angle pipes decorated in cord-impressed, incised, *pointillé,* or watchwheel design. One pipe, made of steatite, was apparently broken in use and was later reworked into a ring or bead. It is noteworthy that no trumpet bowl pipes are found on the Miller Field site or on other sites in the neighborhood. Most of the bowls are either cylindrical or slightly barrel-shaped.

The features found on the Miller Field site have already been discussed; these include pits and hearths, burials, house-patterns, and a possible sweat lodge. A number of inferences can be drawn from the evidence found in such features. The reason for the existence of some of the smaller pits is a matter of uncertainty, but the deep basin or silo-shaped pits were very probably storage cellars, with the presence of possible ladders, posts, or racks indicated by postmolds in the center of the floor. Charred corncobs, kernels, and husks were found in some silo-shaped pits as also were beans, the shell and meat of butternut, hickory nut, and acorn. A cache of copper sheet fragments from a pit of the Historic period preserved a number of squash seeds. Pits of wild plums were found in a hearth.

The double-posted, round-ended longhouses appear to have been

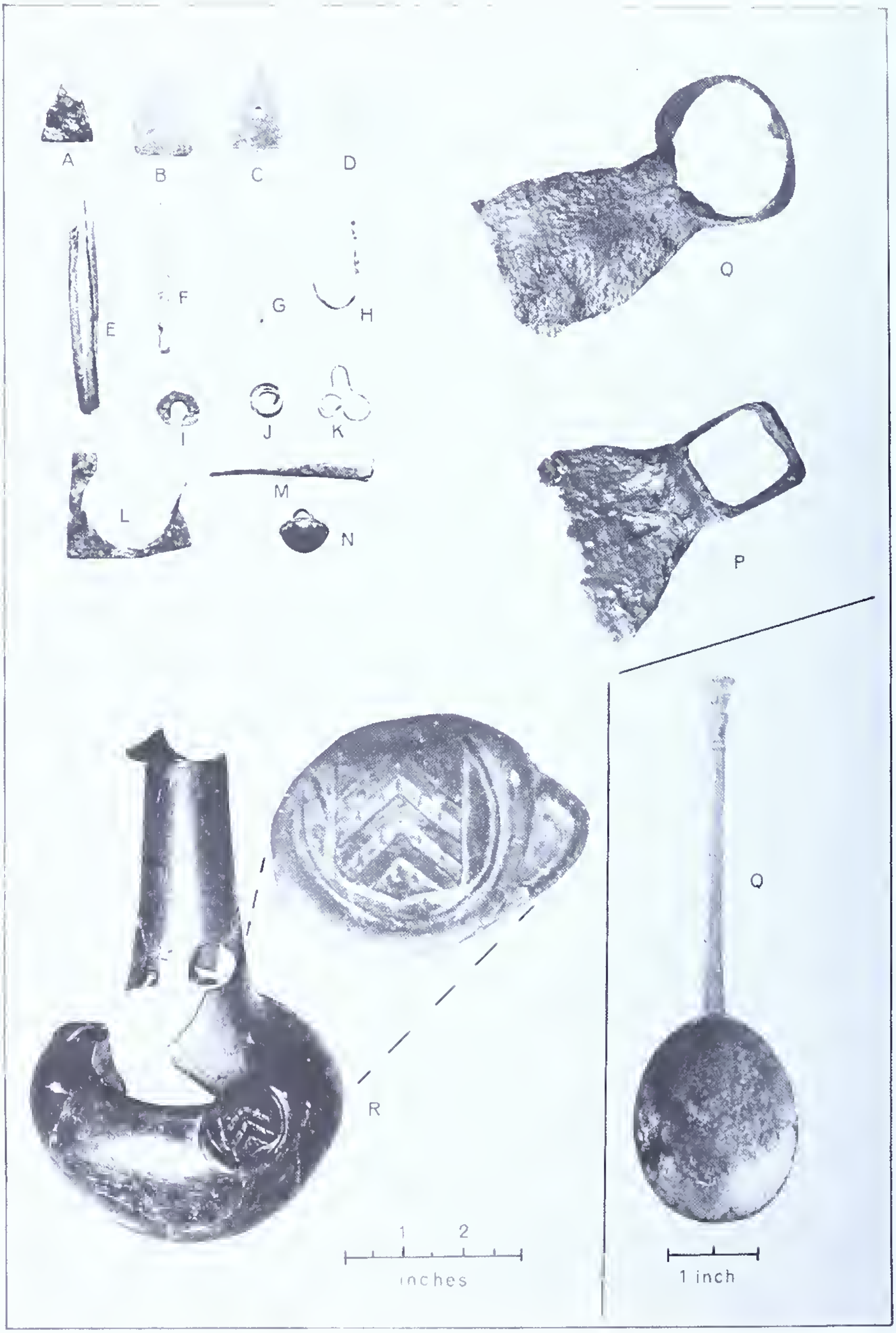

Fig. 12. HISTORIC TRADE MATERIAL FROM THE MILLER FIELD SITE: A, iron arrowhead with perforation; B-D, brass arrowheads with perforations; E, F, brass tubes; G, twisted brass gun wadding pick (?); H, brass fishhook (?); I, brass disk or sequin; J, brass wire coil or ring; K, brass wire earring; L, waste brass cut-out; M, brass jingler or bangle; N, brass button; O, iron hoe blade; P, iron hoe or adze blade; Q, silver-plated seal spoon; R, black glass spirit bottle and enlargement of its seal.

very substantial (Fig. 4). Their dimensions, construction, and orientation have already been discussed. Partitions within the structure (Fig. 3) may represent separate living quarters for matrilineally related families. It has often been suggested that the Indians inhabited houses on the Delaware Valley flood plain during the spring, summer, and fall and then retreated somewhere to the mountains or to the interior for the winter months. On the basis of the findings at the Miller Field site and more recently at the Harry's Farm site, this does not appear to be the case. No winter quarters have yet been discovered to support the theory of a winter migration to the interior. Moreover, the round houses and longhouses on the flats give evidence of having been provisioned for winter living. The large silo-shaped storage cellars outside the houses were probably filled with beans, corn, squash, pumpkins, and nuts (charred evidence of which has been found) as well as dried meat, fish, and other edibles. Deep storage pits were also dug inside the houses in order to provide accessible food in times of inclement weather, or when exterior storage pits were deeply covered by snow. Shelled or milled corn was probably stored in baskets or pottery vessels, while other dried foods could be hung from the roof poles. It is unreasonable to expect that the horticultural Indians of the Late Woodland period would have expended so much energy in gardening unless they were preparing for the food requirements that accompanied the wintertime. Moreover, it is unlikely that the interior or the mountain was sufficiently attractive in the wintertime to induce these Indians to give up their well-constructed lodges.

Historic Period

What little is known about the aboriginal Indian at the time of European contact comes from the writings of a few early observers and the Moravian missionaries who accompanied the Lenni Lenape Indians westward after their eviction from New Jersey. Few archeological sites in New Jersey have yielded European trade goods *in situ*. The Bell-Philhower site (Heye and Pepper 1915: Ritchie 1949) the Bell-Browning site, the Abbott Farm site (Cross 1956), the Davenport site (Leslie 1968b), and the brief notations in Cross (1941: 184) are the reported instances of *in situ* European trade goods. The historic artifacts found in the pits and burials on the Miller Field site are therefore of considerable interest. Many of these were, incidentally, found by Staats.

The Pahaquarra Copper Mines are located within a mile of the

Miller Field site, and its ore deposits were allegedly worked by the seventeenth-century Dutch, although no actual records exist to support such an early exploitation of these mineral resources. The metal was not mined by the Indians, and no native copper artifacts are known to have been found in the Upper Delaware Valley. Moreover, such trade items from the Miller Field site as can unqualifiedly be identified are English and not Dutch.

Eight kaolin tobacco pipes have been found; only one, however, has a remaining mark of identification, and so far even this is obscure. Though the sample is small all have a stem hole diameter of 8/64 of an inch, which according to the Harrington scale of stem hole diameters indicates that the pipes date from A.D. 1620 to A.D. 1680 (Harrington 1954; Cotter 1968: 69). One Indian clay pipe is an obvious attempt to imitate the kaolin pipe.

Brass, iron, and silver objects were found in fair abundance. A shallow pit held a fiber pouch containing 18 rectangular pieces of sheet copper measuring from one to three inches in length and about .75 of an inch in width. A triangular arrowhead of brass with a rivet (?) perforation was also included (Fig. 12 B-D). This cache had been wrapped in cloth and inserted into the fiber pouch. A number of squash or pumpkin seeds were found in and around the cache, and these together with the cloth and fiber were preserved by the copper salts. No brass kettles were encountered, but these were undoubtedly cut up and employed in the manufacture of the numerous articles of personal adornment described below. Evidence of the original pots can be seen in the discarded mended sections containing lead plugs or rivets.

Some flat brass plates were cut up into elongated triangles that were subsequently rolled into conical jinglers. Long brass tubes up to 6 inches in length and .2 of an inch in diameter were found (Fig. 12 E, F). Flat perforated disks or spangles were cut from flat stock, and both disks and waste cut-outs were found (Fig. 12 I, L). The Indian cut many of the brass sheets into long thin flat wires or ribbons and some of these were rolled into rings or coils (Fig. 12 J). An earring, formed of a double spiral and joined by a loop, was doubtless once worn through a slit in the ear lobe (Fig. 12 K). Gun wadding picks (?) (Fig. 12 G), unbarbed fishhooks (Fig. 12 H), and buttons (Fig. 12 N) complete the brass artifact series.

Both square-socketed and oval-socketed iron hoes or adze blades were used by the Indians and later discarded into pits (Fig. 12 O, P).

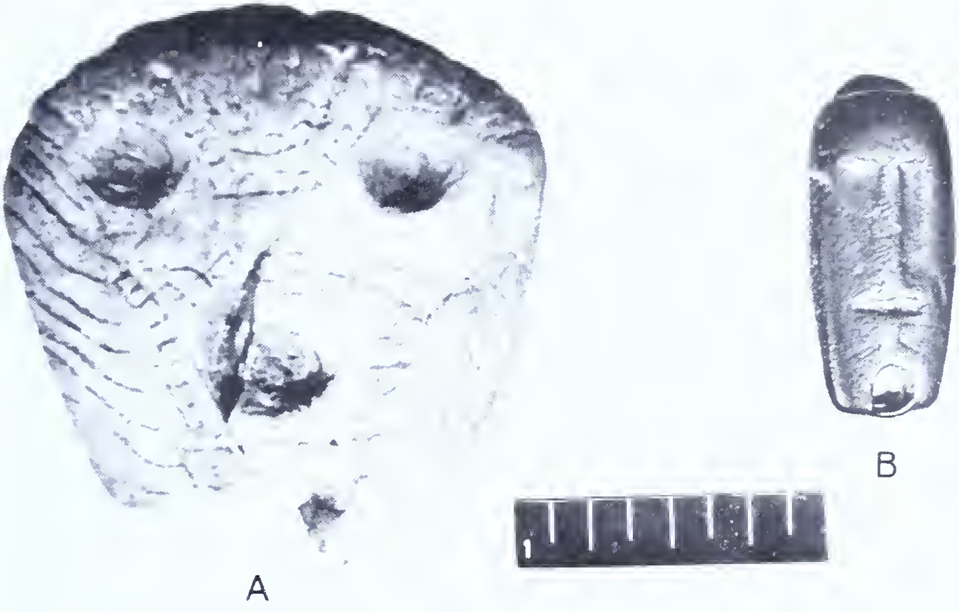

Fig. 13. EFFIGY FACES FROM THE MILLER FIELD SITE: A, siltstone maskette, possibly a "bushy head"; B, steatite pendant.

Iron nails were relatively common and one long double-pointed tool was unearthed. A single perforated triangular iron arrowhead was also found (Fig. 12 A).

By far the most instructive metal artifact was a silver-plated seal spoon found on the sternum of one of the burials (Fig. 12 Q). This spoon is identical to one found at Jamestown, and has been dated between A.D. 1650 and 1700 (Cotter 1968: Fig. 14 A). Regrettably, the hallmark was poorly struck into the bowl and the maker has thus far not been identified, though an English provenience is postulated.

Glass beads were not numerous but they were varied, and like the seal spoon and the bottle described below, suggest a middle to late seventeenth-century provenience. The glass beads found in refuse pits include: one split Carolline d'Alleppo bead, two dark blue and one gray-white translucent decahedral beads, two black spherical beads, one solid white "porcelain" bead and one cane bead or polychrome tubular bead. Two hundred-and-one opaque white seed beads were found about the ankles of an Historic period burial. In general these beads are unlike those described from historic Susquehannock sites in Washington Boro, Pennsylvania (Kinsey 1960: 90-2; Heisey and Witmer 1962: 113-8).

A broken black glass spirit bottle found by Staats in a silo-shaped pit is historically important and informative. The elongated neck and bulbar body mark it as a style dating between A.D. 1650 and 1661 (Cotter 1968: Fig. 8 A). The heraldic seal impressed into the glass is still intact (Fig. 12 R). Staats submitted a photograph of this seal to the College of Arms in London, England, for an analysis of the armorial bearings. The following information is paraphrased from the letter received from A. Colin Cole, Windsor Herald of Arms (Cole July 11, 1968: personal correspondence): The armorial bearings impressed upon the bottle were granted to Bartholomew Plumsted on August 30, 1578. Bartholomew married Jane Symonds and had two sons, namely William and Thomas. Thomas begot Francis who subsequently fathered Clement. It is Clement in whom the interest lies, for he married Mary Cox, daughter of Thomas Cox, a citizen and vintner of London, who made his will on May 24, 1709, and therein mentions Clement Plumsted as well as his (Cox's) 920 acres in Pennsylvania, his cousin Mary Chandler living in Pennsylvania, his 400 acres at Cooper's Creek, West New Jersey, and his shares in the Pennsylvania Land Company and in the first old Pennsylvania Company.

Clement Plumsted not only had an American connection through his wife Mary, he was also appointed as one of the 12 proprietors of New Jersey. Whether Clement Plumsted himself crossed the Atlantic Ocean, taking the bottle with him, or whether it made the journey in the hands of one of his Cox or Plumsted relations is a matter for speculation. The further question of how this bottle got into the hands of the Indians is also open to interpretation, but a trade relationship with the Indians is reasonable.

Three gunflints complete the inventory of European trade items found on the site. Two of these gunflints are made of a honey-colored flint and one is of black flint indigenous to England.

The Miller Field site is an important link in the chain of sites containing clues to the prehistory of the Upper Delaware Valley. It is a multicomponent site, and together with other sites in the area it reflects significant cultural events and influences from over a wide area, and for a long period of time. Work is continuing on the Miller Field site by both Staats and Seton Hall University Museum in hopes of establishing a better understanding of the archeology of the Upper Delaware Valley and indeed the Northeast in general.

University Museum
Seton Hall University
South Orange, New Jersey

The Zimmermann Site

36-Pi-14

DAVID J. WERNER*

INTRODUCTION

DURING the spring of 1962 Lenape Chapter 12, Society for Pennsylvania Archaeology, conducted a site survey in the proposed Tocks Island Reservoir area between Matamoras and Dingmans Ferry, Pennsylvania. Three test pits on the property of Marie Zimmermann yielded evidence of soapstone bowl fragments and ceramics associated with deeply buried features.

The Zimmermann site (36-Pi-14) is located on the lowest terrace of the broad flood plain bordering the Delaware River two miles north of Dingmans Ferry, Pennsylvania. The site may be located in the extreme lower left corner on the U.S.G.S. Milford Quadrangle, 7.5-minute series, where it occupies the western portion of the 380-foot contour near the mouth of the Dry Brook. Route 209 follows a glacial terrace at the base of the mountain to the west. Elevation of the second lowest terrace is indicated by a bench mark as 402 feet above sea level. The intervening area between this terrace and the site is estimated to be about 370 feet above sea level. This broad, sloping terrace gives some indication of having been part of a former river channel in late Pleistocene times when meltwater covered the valley.

Although the Zimmermann site is afforded some protection by the adjacent mountain ridges, it is subject to winter winds and drifting snow.

Cultivation of the large flood plain was discontinued in 1957, and at the time of excavation the area was covered by thick sod. There is no evidence of a recent or former forest cover. Three small wooded areas occupy sections along Route 209 and the river bank north of the site. Factors which prompted the occupation of the terrace by numerous groups are for the most part present today, including good drainage, fresh water, an abundance of game and fish, and fertile soil. Evidence of occupation follows the slightly undulating crest of the terrace in a wide arc from west to east. The highest point of the terrace occurs 350 feet from the Dry Brook.

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*Lenape Chapter 12, Society for Pennsylvania Archaeology, Port Jervis, New York 12771.

A grid of 10-foot squares was established along the crest of the terrace to include original test Pits 2 and 3. The datum line A-B provided a magnetic bearing of 50 degrees which was approximately northeast by east while the grid line A-C was 320 degrees or about northwest by north. The initial grid comprised an area of 40 feet by 100 feet. Subsequently a part of this was extended to a maximum length of 360 feet. This area is referred to as Section 1. The area adjoining Section 1 to the east is referred to as Section 2. Sections 3 and 4 adjoin the first two and extend westward toward the creek for a distance of 160 feet (Fig. 14).

Individual records included feature sheets, horizontal diagrams, profiles, and artifact record cards. Pertinent data for all features were kept on individual feature sheets along with horizontal and vertical measurements to show relationships to natural stratigraphy. Control balks between adjoining squares were utilized to make profiles. Many features as well as large exposed areas of the site were photographed in color and black and white. Excavations began on May 7, 1962, along the datum line A-B and continued during the summer months to completion on November 15, 1967. All soil was removed by hand, using round pointed shovels for the removal of sod and flat shovels for the underlying soil. Trowels, screens of various mesh size, and smaller tools were employed in the excavation of features and areas of concentration.

Where the concentration of pits was greatest the surrounding subsoil was stained black to a maximum depth of nine inches, preventing early observance of pit outlines or postmolds. This condition necessitated the vertical sectioning of squares in the form of narrow trenches, which were expanded a few inches at a time until the stained soil was removed or features were encountered. Although this method was successful in locating the lower portion of the pits, the upper few inches were not easily discernible. Close observation of small traces of charcoal, fire-cracked stone, sherds, and soil density was required to obtain an approximation of the dimension of the pit orifice. All pits were cross-sectioned and in some cases quarter-sectioned to determine shape and stratigraphy. Hearths and burials were fully exposed and the latter preserved when possible.

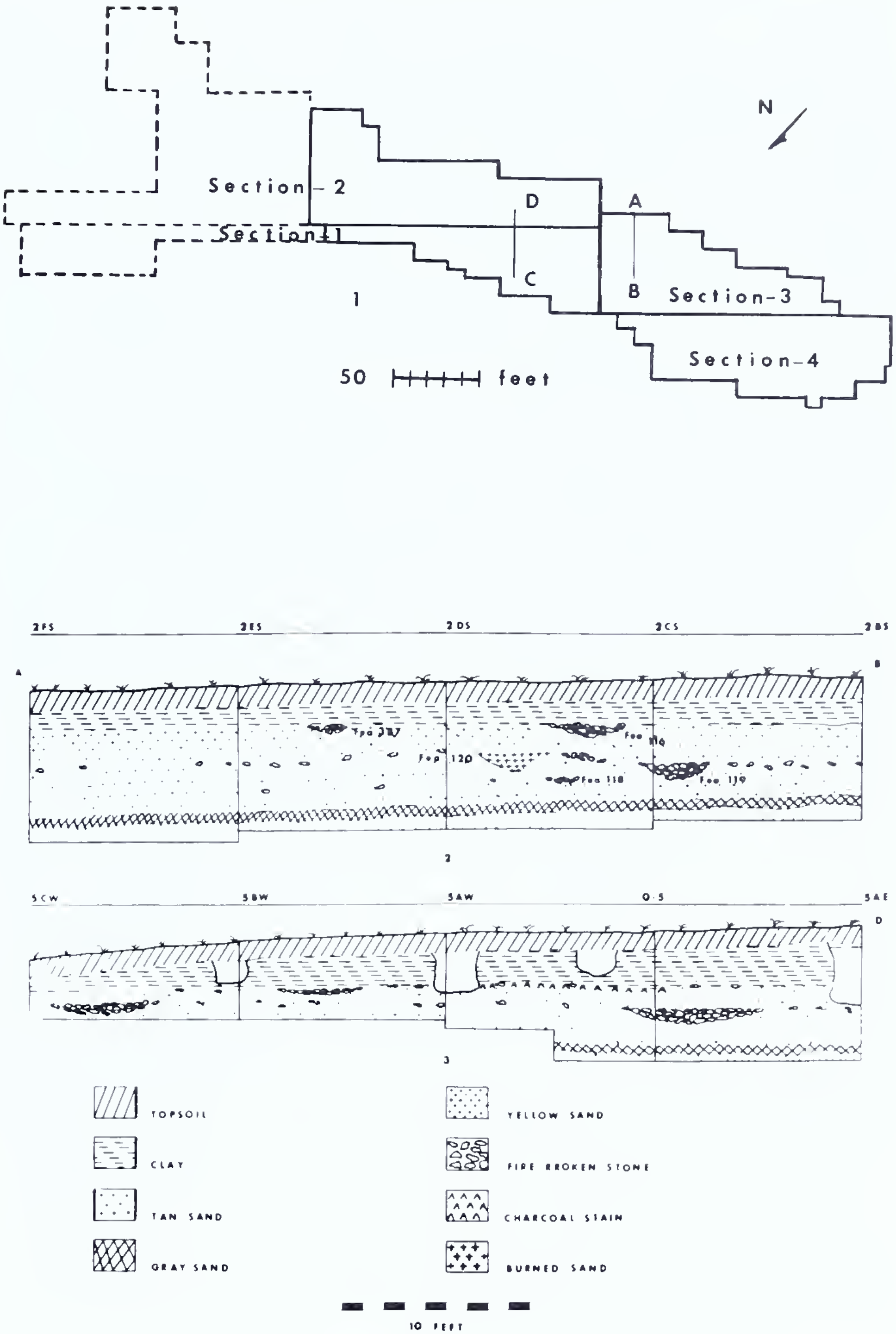

Fig. 14. KEY TO THE ZIMMERMANN SITE EXCAVATION. Solid lines indicate excavation areas shown in Figures 15 to 19 (top). Profile A-B, Section 3, (middle). Profile C-D, Sections 1 and 2, (bottom).

STRATIGRAPHY

The Upper Delaware Valley has been a locus of man's activities for several thousand years. The various flood deposits at the Zimmermann site contain cultural materials that represent a span of approximately 3,300 years or about one-third of the total period of aboriginal occupation. During the final stage of this occupation numerous pits dug by the occupants intruded into the deepest occupational level. Other factors contributing to the disturbance were two small pits attributed to recent human activity and the burrowing of rodents.

Beginning at the surface the natural soil zones may be described as follows:

Zone 1 is a dark brown sandy loam, 11 to 12 inches thick, covered with a thick sod. It is derived from the sandy clay subsoil, thin mantles of flood silt, and decayed vegetation from earlier cultivation. Articles of Indian manufacture were fairly numerous throughout this zone as were fire-shattered stones, fragments of modern soda bottles, brass cartridge cases, rusty nails, coals, and fragments of china. Cultivation has destroyed (Level 1) the late prehistoric and historic midden throughout the major portion of the site.

Zone 2 was not discovered until 1965 when it appeared in the eastern end of Section 2. It consisted of a thin layer of light flood sand ranging in thickness from zero inches on the west side of the section to seven inches on the east side. The zone did not occur in the other sections. Its occurrence on the extreme eastern end of the site nearest the river indicates minimal flooding of a small area along the river bank. The deposition of this thin and largely sterile layer probably occurred sometime after A.D. 1100, but before the last occupation as evidenced by a few late Owasco sherds found at the top of the zone. Early Owasco artifacts and hearths were located immediately beneath the sand layer in a black midden, designated Level 1A, which covered the top of Zone 3.

Zone 3 is a consolidated layer of light-yellowish clay, 14 to 16 inches thick, in Sections 1, 3, and 4. This blended into a fine, light silt in the eastern portion of Section 2, where it attained a maximum thickness of 27 inches. Four hearths and one pit were the only features encountered in this nearly sterile zone. Projectile points found include lobate-stemmed, expanded-stemmed, corner-notched, lozenge, and side-notched types. Pottery includes corded-punctate, wiped, dentate-stamped, and modified interior cord-marked types (Lopez 1957:

25). Artifacts were found associated with features and scattered throughout this zone. This level was designated 2A.

Zone 4 is a layer of light-tan sand having a maximum thickness of 42 inches and containing occasional small sandstone pebbles. A thin, red clay seepage vein occurred at the juncture of Zones 3 and 4. Numerous hearths, artifacts, and scattered debris were found within a two- to four-inch thick midden (Level 2B) at the top of this zone in Sections 3 and 4. Artifacts include both Early and Middle Woodland types, suggesting a long exposure of the surface with little or no new deposition during these periods. A fluid condition must have existed at one time, as evidenced by the presence of very small sherds of identical ware at the top of the midden and large sherds at the base. Level 2B in Section 2 was clearly separated from Level 2A by 10 to 12 inches of light silt. Artifact types found in Level 2A of Section 2 were identical to those from Level 2B, Sections 3 and 4. This indicates the compressed nature of the midden in Sections 3 and 4.

The basal portion of Zone 4 contained two cultural levels. The uppermost contained a transitional Late Archaic to Early Woodland component covering the entire site, designated Level 3. Numerous features and distinctive artifact types were present. Level 4 was separated from Level 3 by 8 to 12 inches of sand containing several hearths and artifacts relating to the Susquehanna phase and the stemmed-point tradition of the Delaware Valley Archaic complex.

Zone 5 is a thin, sterile layer of dark gray sand, four to six inches thick. This sand layer covers the entire area of the site and may represent an old humus zone.

Zone 6 is light-yellowish sand of unknown depth. Test pits to a depth of 13 feet revealed no evidence of pebbles, earlier middens, or former vegetation zones. Red clay seepage veins did not occur below a depth of seven feet.

FEATURES

Features found on the site were numerous, the largest percentage of which were pits and hearths.

PITS

Of the 238 features recorded as pits, 236 occurred in Level 1. The remaining pits were found in Levels 1A and 2. Fifty-eight per cent (139) of the pits in Level 1 were sterile, or contained scanty amounts of trash including broken stone, charcoal, and flint spalls.

Pits ranged from two to seven feet in diameter and from 9 to 78 inches in depth. Pit profiles obtained from vertical sectioning revealed

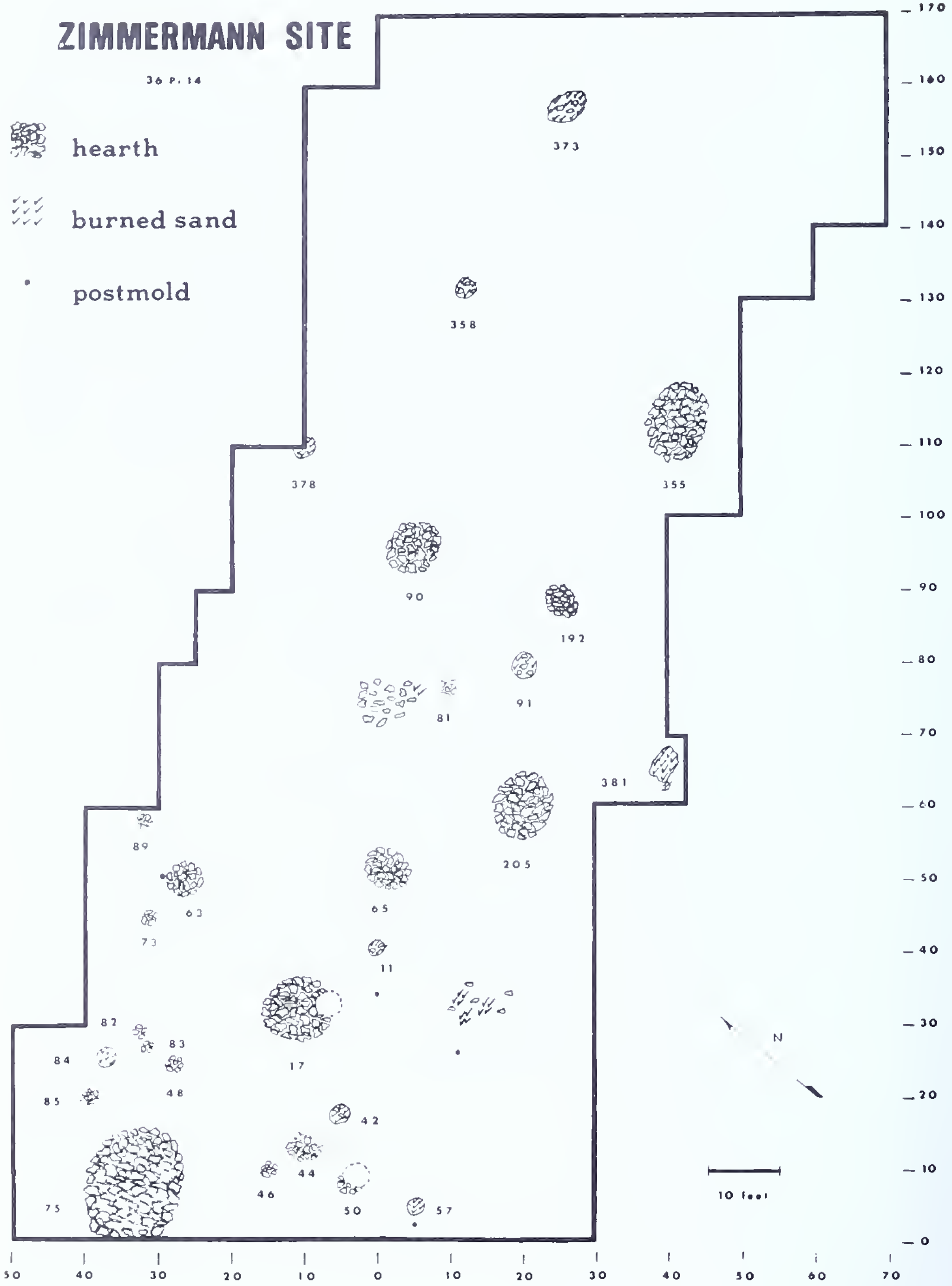

Fig. 15. EXCAVATED AREA, Sections 1 and 2, Level 3, at the Zimmermann site.

the following types: bell-shaped (123), basin-shaped (105), saucer-shaped (5), and cylindrical (3). Similar pit features were found on other sites in the Upper Delaware Valley, including the Bell-Philhower site (Ritchie 1949: 166-7) and the various sites reported in the present publication.

The large pits were probably utilized for food storage. Two pits each contained about a half bushel of charred corn resting on a coarse grass lining, and charred grass and corn husks occurred in two additional pits. While the original function of the larger pits may have been storage, their final use was as a repository for garbage and trash. This is attested to by the inclusion of varying quantities of pottery, stone, charcoal, animal bone, shell, and various broken and unbroken tools. Six pits contained quantities of mussel shell. Although several pits held patches of burned sand, fire-broken stones, and charcoal and ash, only one seems to have been utilized for cooking. Burned soil occurs as isolated patches intermixed with unburned soil, ash, broken stone, charcoal, charred bone, and pottery in one or more levels, and suggests hearth cleanings rather than *in situ* fires. The one exception was a shallow, irregular, saucer-shaped pit depression filled with charcoal, ash, and fragments of charred twigs. This feature measured six feet by three feet and had a depth of nine inches. Occasionally burials were found in the larger pits (Features 5, 37, and 238 in Sections 1 and 2, and Features 231 and 237 in Sections 3 and 4). One pit in Section 2 contained two burials (295 and 376).

BURIALS

Excavations revealed a horizontal clustering of burials in three separate areas, with graves scattered in a fourth area. Four burials were found in the western end of Section 4 (Fig. 19), seven in the western end of Section 1 (Fig. 18), six in the central area of Sections 1 and 2 (Fig. 18), and five burials were randomly scattered over 170 feet of the eastern end of Sections 1 and 2. This is a total of 22 burials.

Burial 8 (Feature 406) and Burial 15 (Feature 245) contained only skulls. The former consisted of a badly crushed child's skull in a small, shallow pit. The dental age was 6 to 10 years. Included with the skull were four fragments of the clavicle (stained by contact with three brass bells); a fish effigy of shell, two inches in length with lateral perforation; and two claw-like separators, also of shell.

Burial 15 (Feature 245) contained a badly crushed adult skull, which had been placed face down in a small, shallow pit. The dental

Table 1. Zimmermann Site Burial Traits, Level 1.

Burial	Feature	Position	Headed	Facing	Grave Type	Sex	Age	Condition	Grave Goods
1	5	flexed	south	east	deep pit	M	40-45	good	
2	4	flexed	south	east	shallow	U	adult	disturbed	
3	29	loosely flexed	south	east	shallow	U	adult	disturbed	
4	31	flexed	SW	east	shallow	U	adult	disturbed	
5	37	flexed	SW	east	pit (top)	U	U	decomposed	pipe (Fig. 39, No. 7)
6	51	U	U	U	shallow	U	U	disturbed	
7	61	U	U	U	shallow	U	U	disturbed	
8	406	U	U	U	pit	U	6-10	crushed	3 hawk bells, 1 fish, & 2 claw effigies (shell)
9	137	loosely flexed	south	east	shallow	M	adult	poor	
10		records missing							
11	227	loosely flexed	SW	east	shallow	F	adult	poor	
12	231	flexed	SW	NW	deep pit	M	adult	poor	
13	237	flexed	SW	west	deep pit	F	adult	fair	
14	238	flexed	SW	east	pit	M	adult	fair	
15	245	U	U	U	pit	U	U	crushed skull	powdered ochre
16	295	flexed	SW	east	pit (top)	U	adult	poor	
17	314	loosely flexed	south	east	shallow	U	adult	poor, decomposed	
18	327	flexed	south	east	pit (cist)	U	infant	poor, decomposed	
19	263	redeposited	U	U	pit (top)	U	U	fragmentary	
20	386	flexed	SW	up	shallow	U	adult	poor	
21	361	U	U	U	pit	U	infant	poor, decomposed	
22	362	flexed	west	east	shallow	U	adult	poor, decomposed	
23*	376	loosely flexed	west	north	deep pit	F	adult	good	

* Note: Burial 23 was found beneath burial 16 at the base of the pit.

Key: U, undetermined; M, male; F, female.

age is that of a young adult. A handful of powdered red ochre had been sprinkled over the skull.

Burial 17 (Feature 327) was a departure from the normal interment for in this grave an infant had been placed in the bottom of a pit and covered with 15 large flat river cobbles. These ranged in size from 8 inches to 24 inches in diameter and they were about three inches thick. The bones were badly decomposed with only a few skull, jaw, and rib fragments preserved. Staining at the base of the pit measured 24 inches by 14 inches. This type of burial is frequently encountered on Proto-Susquehannock sites (Witthoft 1959a: 58).

A summary of observations on the skeletal material is included in Table 1. Age and sex determinations are educated estimates.

Hearths

One hundred and twenty-five features of varying types and occurring throughout all levels have been placed in this category. The types and details are described for each level of occupation.

Level 4: A total of 19 hearths was recorded for this level, and these ranged in size from 14 inches to 46 inches. The largest hearth was basin-shaped and consisted of a layer of river cobbles lining a shallow, circular depression. Four of the hearths were completely excavated and one partially excavated. One was sterile while the others contained various amounts of charcoal. Two of the five held a few fire-shattered rocks resting on a basal layer of unbroken stone, while the others were filled with unbroken stones. Fourteen small hearths were randomly distributed throughout the western half of the site in the areas between the larger hearths. These consisted of small groups of fire-cracked stones resting on sand that was charcoal-stained or reddened. Eleven of the 14 hearths contained small fragments of calcined bone and three had been disturbed.

Artifacts and chipping waste were closely associated with these small features. In Sections 3 and 4 nine of the smaller hearths were grouped around two of the larger type at distances of 5 to 20 feet. Hearth 62 (Feature 230) consisted of a circular area of fire-reddened sand, 26 inches in diameter. It contained several fire-cracked stones and small fragments of calcined bone. Broken stones appeared to have been removed from Hearth 59, a basin-shaped feature some five feet distant, since hearth stone was scattered between the features. A Susquehanna broadspear was found on the southern perimeter of Feature 230 and a charcoal sample from Hearth 59 (Feature 226)

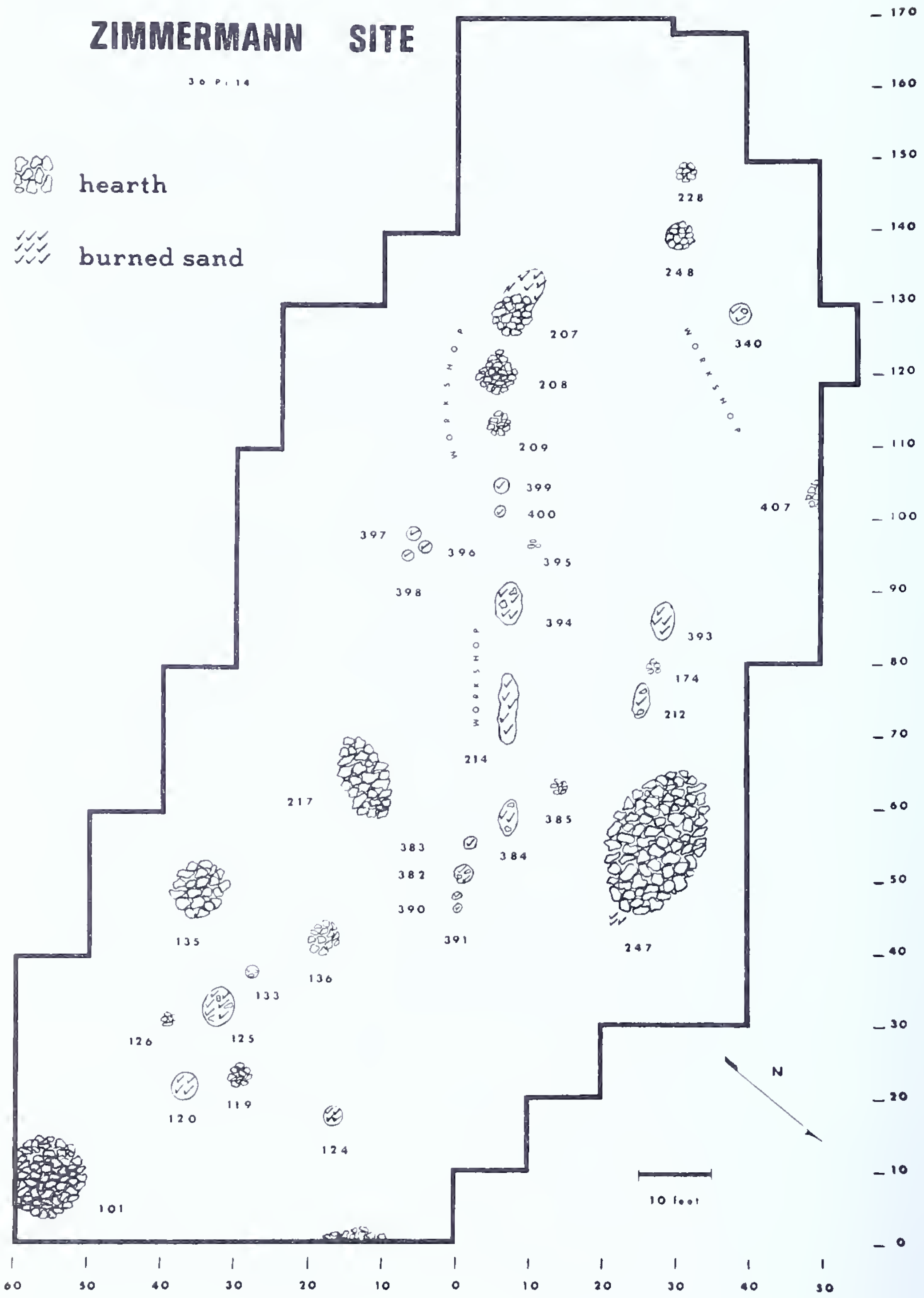

Fig. 16. EXCAVATED AREA, Sections 3 and 4, Level 3, at the Zimmermann site.

provided a radiocarbon date of 1650 B.C. ± 80 years (Y-2344) for the Susquehanna component.

Level 3: Twenty-one hearths, or nearly one-third of the 67 hearths excavated in this level were of the large platform type with lengths ranging from 5 feet to 22 feet (Figs. 15; 16). Filled with fire-cracked stones, charcoal, and ash to a maximum depth of one foot, they rarely contained artifacts. Smaller hearths, like those in Level 4, were irregular groups of fire-cracked stones, usually associated with patches of burned sand and fragments of calcined bone. Fragments of soapstone vessels, Dry Brook fishtail points, tools, and waste chips were frequently associated with these small features. The third type of hearth consisted of round, oval, and elongated areas of burned sand with generous quantities of small fragments of calcined bone, and waste flakes. The depth of these artifact deposits ranged from four inches to seven inches, with four inches more common.

Level 2: A majority of the 26 hearths found in this level were located in Sections 3 and 4 (Fig. 17). Three large platform hearths, Features 191, 201 (Section 3) and Feature 354 (Section 2), with closely associated areas of burned sand are very similar to the large structures found in Level 3. The more numerous basin-shaped hearths are apparently most common to Early and Middle Woodland cultures, and these range from a few inches to 48 inches in diameter. Identical features occurred in the superior portion of this zone referred to as Level 2A in Sections 1 and 2.

Level 1A: Four hearths, including three small basin-shaped and one small irregular platform, were widely scattered over the eastern half of the site. They range in size from 21 inches to 54 inches.

An ash bed, Feature 346, four to six inches thick and 15 feet in diameter, was found in the extreme eastern end of the site. This feature may have been related to the drying of fish and game.

Level 1: The nearly complete destruction of the last occupational surface by cultivation left little evidence of the numerous hearths that must have been present during several centuries of occupation.

In the extreme eastern end of the site where flood deposits in recent times protected part of the old surface, four hearths were present. All were between 14 and 18 inches in diameter, basin-shaped, and contained fire-cracked stones, charcoal, and ash. Two features also contained sherds and spalls. Four small, circular patches of burned earth, four to six inches in diameter, appeared to be the remains of hearths. These occurred at the junction of the plowed zone and the subsoil in Sections 3 and 4 (Fig. 19).

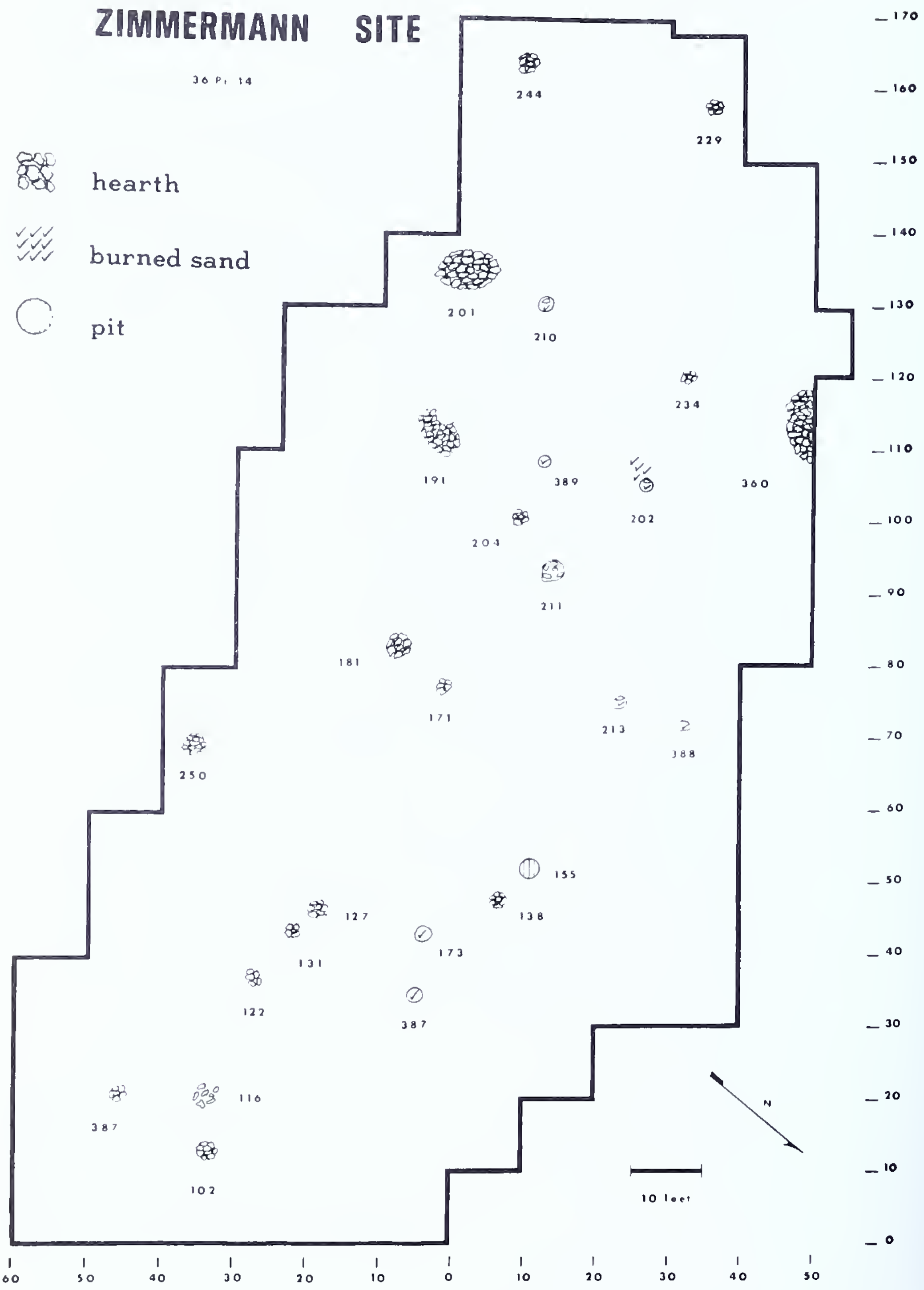

Fig. 17. EXCAVATED AREA, Sections 3 and 4, Level 2, at the Zimmermann site.

POSTMOLDS

Twenty-six postmolds were identified, of which four were from Level 3 and 22 from Level 1. Those in the former area occurred in hearth or burned sand areas (Fig. 15), while postmolds in Level 1 were widely scattered throughout Sections 3 and 4. Only three postmolds were recorded for the west end of Sections 1 and 2. Postmolds varied in diameter from two to three inches. All tapered at the base and penetrated the subsoil from 10 to 18 inches. Postmolds in Level 1 were associated with the pit concentrations (Fig. 19) but did not define house patterns.

DOG BURIAL

One fully articulated dog skeleton, of medium size, was found in the base of Pit 52 (Feature 72). The dog, possibly a pet, had been carefully placed in the base of the pit against the south wall. The preservation of the skeleton was exceptionally good considering the strong acidity of the soil in the area. An attempt was made to remove the skeleton intact for study. Using wire mesh and cement the skeleton was encased in a cement basket, and the entire feature was covered by a plastic sheet and heavy planking while the cement dried. At a time when the excavators were not present the site was visited by unknown persons who disturbed the planking and caused the skeleton to be hopelessly crushed.

SIDEHILL DUMP

The steeper northern flank of the terrace, 250 feet east of the datum, provided a convenient area for disposal of refuse. An area 25 feet by 30 feet buried beneath a maximum of 22 inches of erosional deposition contained a concentrated mantle of trash and artifacts pertaining to the historic occupation of the site. Beneath this layer, at depths of 24 to 32 inches, was a thin scattering of artifacts attributed to earlier components. Apart from a few pits with well-defined layers, this condition of deposition provided the only stratigraphic situation for Late Woodland materials.

ARTIFACTS

A total of 1,559 non-ceramic artifacts was unearthed. Projectile points (439, or 28 per cent) were the most abundant chipped stone artifact from all levels. Pottery was of sufficient quantity to allow a comparative study of types with those from the surrounding region. Assemblages and associations are discussed for each level.

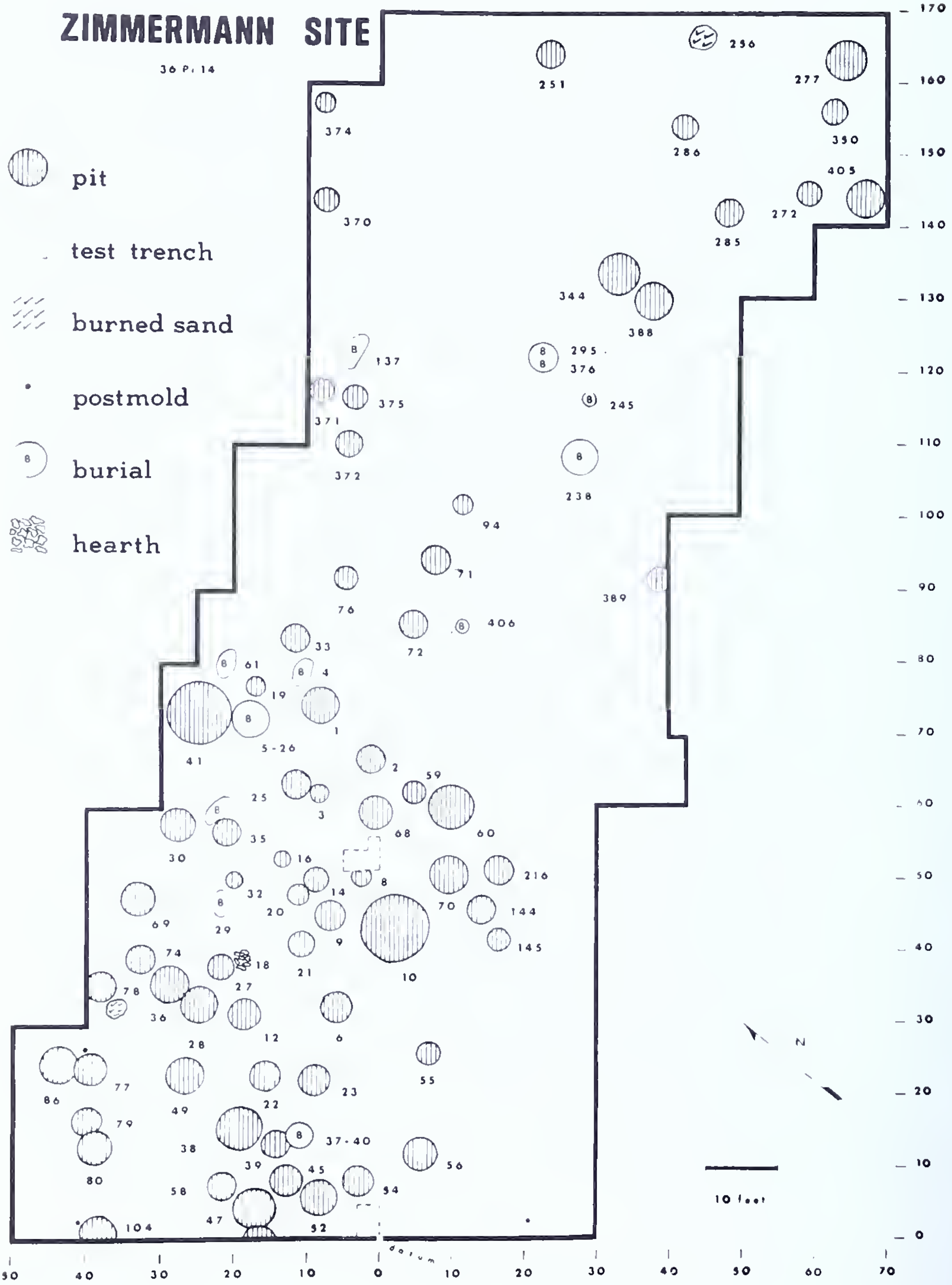

Fig. 18. EXCAVATED AREA, Sections 1 and 2, Level 1, at the Zimmermann site.

Delaware Valley Archaic Complex, Broadspear Tradition—Susquehanna Phase

Level 4 contained a component of the Susquehanna phase which was concentrated in Sections 3 and 4, but traits of this component were found in other sections. Also mixed in this level were the diagnostic Lackawaxen Stemmed points. The following describes the features and artifacts for these two components.

Chipped Stone			
Delaware Valley Archaic Complex			
Lackawaxen—Straight Stem Subtype		11	
Argillite	9		(Fig. 21, No. 6)
Rhyolite	1		(Fig. 21, No. 8)
Black Flint	1		(Fig. 21, No. 10)
Lackawaxen Converging Stem Subtype		5	
Argillite	5		(Fig. 21, No. 7)
Drill, Reworked Lackawaxen Stemmed		1	
Argillite	1		(Fig. 22, No. 2)
Blank, crude		13	
Argillite	13		(Fig. 22, No. 4)
Broadspear Tradition			
Susquehanna Broadspear		33	
Rhyolite	19		(Fig. 21, Nos. 2, 4, 13)
Gray Chert	11		(Fig. 21, No. 5)
Argillite	2		(Fig. 21, Nos. 1, 3)
Black Flint	1		
Pentagonal Blanks		2	
Rhyolite	1		(Fig. 21, No. 12)
Argillite	1		(Fig. 21, No. 11)
Drill			
Reworked Susquehanna Broadspear		1	
Rhyolite	1		(Fig. 22, No. 1)
Knives			
Broad Stemmed, Argillite	1		
Pentagonal, Rhyolite	1		(Fig. 22, No. 3)
Semilozenge, Jasper	1		
Utilized Flakes, Jasper		1	
Choppers		17	
Thick Oval	16		(Fig. 22, No. 6)
Spade-shaped	1		(Fig. 22, No. 5)
Altered by Usage			
Scarified Pebble		1	
Anvil		1	
Hammerstone, Unpitted		1	
Worked Pebble		1	

Associations

Projectile points constitute 55 per cent of the chipped stone artifacts. Susquehanna broadspears, predominately of rhyolite, were

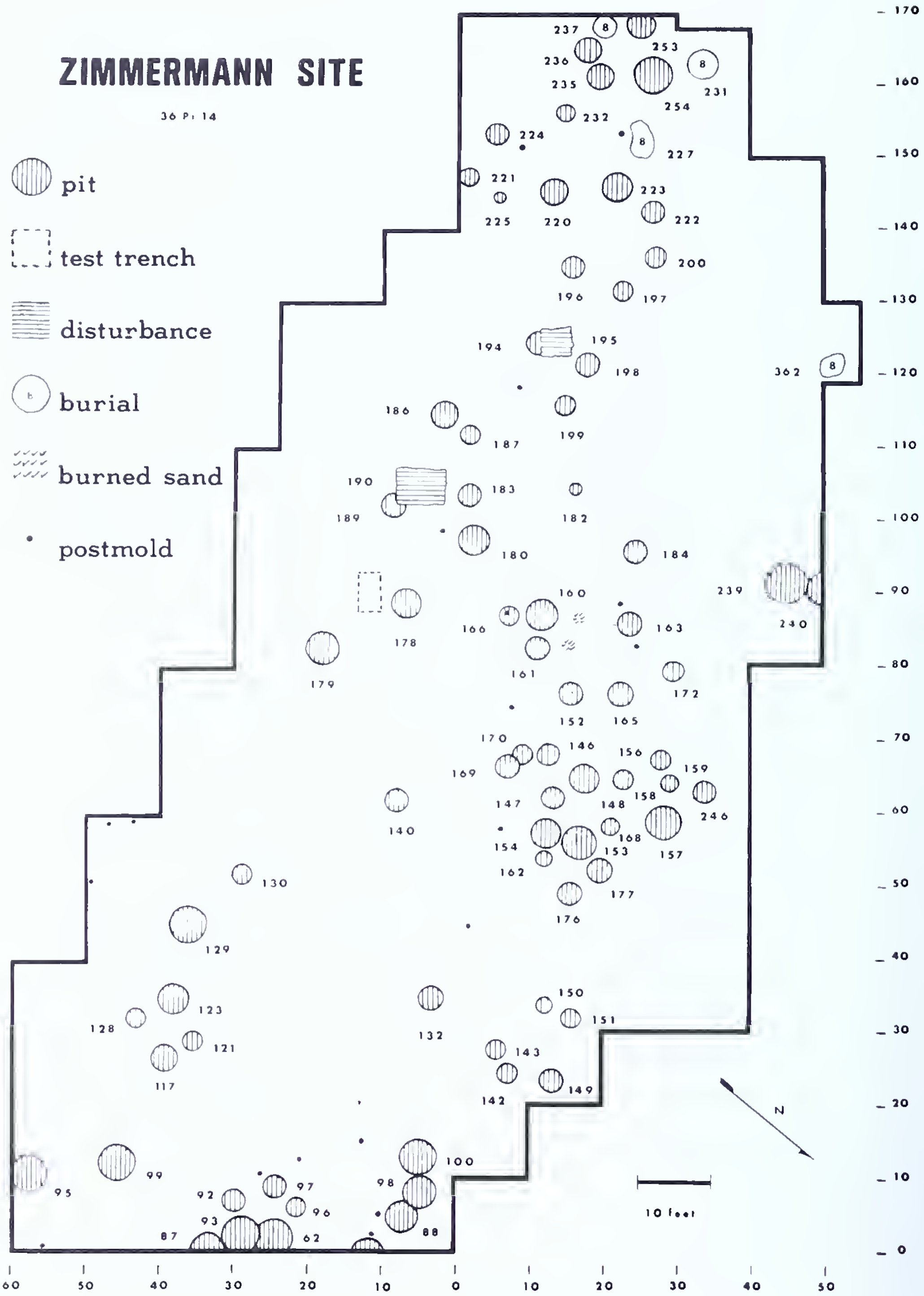

Fig. 19. EXCAVATED AREA, Sections 3 and 4, Level 1, at the Zimmermann site.

frequently associated with specimens of gray and black flint. On four occasions they were found in close association with Lackawaxen points. Hearth 21 (Feature 111) contained one Lackawaxen point and near its western edge a chopper (Fig. 22, No. 5), a Susquehanna broadspear point of rhyolite, and an oval, chopper-like tool (Fig. 22, No. 6).

Hearth 128 (Feature 401) had in close association three rhyolite Susquehanna points, a stemmed drill of argillite (Fig. 22, No. 2), and a fragmentary oval chopper. The oval chopper-like tools (Fig. 22, No. 6), are bifacially chipped from siltstone cobbles. They were found singly and in a cache of five. The cache and a single specimen were found to the east of Hearth 48 (Feature 203) with an argillite Lackawaxen point. An oval chopper and a Lackawaxen point were found on the west side of the hearth. The hearth contained an anvil stone, a small battered sandstone pebble hammer, and 25 flakes (20 of a dark gray chert, 1 siltstone, 1 rhyolite, and 3 black flints).

Crude blanks and pentagonal-shaped blanks occurred. In one instance an example of the former (Fig. 22, No. 4) was apparently associated with a Lackawaxen point, while a cache of 13 argillite blanks was found near Hearth 70 (Feature 249). The thin, pentagonal form, generally made of either reddish argillite or rhyolite, (Fig. 21, Nos. 11, 12) was associated with Susquehanna broadspears. A partially worked specimen (Fig. 21, No. 13) was in two fragments which were in direct contact with a complete Susquehanna point of rhyolite from a small workshop area near Hearth 105 (Feature 380) in Section 2. Also present were: one Susquehanna broadspear of reddish argillite (Fig. 21, No. 1), a fragmentary Lackawaxen point, and waste materials (2 large spalls and 9 flakes of Poxino Island green shale, 15 rhyolite flakes, 1 argillite flake, and 8 flakes of reddish argillite).

Stemmed points of the Lackawaxen type of rhyolite and black flint (Fig. 21, Nos. 8-10) and the drill and knife forms of rhyolite (Fig. 22, Nos. 1, 3) occurred as isolated finds.

Fishtail Tradition—Dry Brook Component

The total artifact assemblage from Level 3, excluding soapstone fragments, represents 38 per cent of the total yield from the site. Projectile points and rejects total 300, or slightly more than 50 per cent of the stone artifacts for this level.

Chipped Stone

Dry Brook Points		271	(Fig. 23, Nos. 1-16, 19, 20)
Dry Brook Rejects		20	
Dry Brook Rechipped Forms		4	(Fig. 24, Nos. 1, 2)
Blanks		102	
Crude	67		(Fig. 23, Nos. 21, 22)
Refined	35		(Fig. 23, Nos. 23, 24)
Drills		19	
Reworked Fishtail Points	16		(Fig. 24, No. 10)
Expanded Base	3		(Fig. 24, No. 9)
Knives		11	
Fishtail Points	5		(Fig. 24, Nos. 7, 8)
Triangular Bifaces	5		(Fig. 24, No. 11)
Prismatic Flake	1		(Fig. 24, No. 17)
Scrapers		14	
Fishtail Point Form	11		(Fig. 24, Nos. 3, 4)
Side, Thick Flake	3		(Fig. 24, No. 12)
Spearpoint		7	
Broken	6		(Fig. 23, Nos. 17, 18)
Knife	1		
Strike-a-light		23	
Fishtail Points	21		(Fig. 24, Nos. 5, 6)
Spalls	2		
Picks		2	(Fig. 27, No. 1)
Celts		2	(Fig. 25, No. 9)
Utilized Flakes		42	
Choppers		7	
Netsinkers		7	(Fig. 25, No. 7)

Ground and Polished Stone

Celts		7	(Fig. 25, No. 8)
Adze		1	(Fig. 25, No. 10)
Spearthrower Weight—Soapstone		1	(Fig. 25, No. 2)

Altered by Usage

Hammerstones, Unpitted		10	(Fig. 27, No. 3)
Hammerstone/Abrading Stone		2	
Hammerstone/Anvil		1	
Anvils		5	
Abrading Stones		11	(Fig. 25, Nos. 1, 4, 5)
Mortar		1	

Soapstone Artifacts

Gorget—3-Hole, Semilunar		1	(Fig. 25, No. 6)
Pendants		3	
Triangular	1		(Fig. 24, No. 20)
Oval (grooved ?)	1		(Fig. 25, No. 3)
Elliptical (segmented)	1		(Fig. 24, No. 19)
Beads		7	
Circular	3		(Fig. 24, No. 16)
Irregular	2		(Fig. 24, No. 15)
Washer-shaped	1		(Fig. 24, No. 14)
Barrel-shaped	1		(Fig. 24, No. 13)

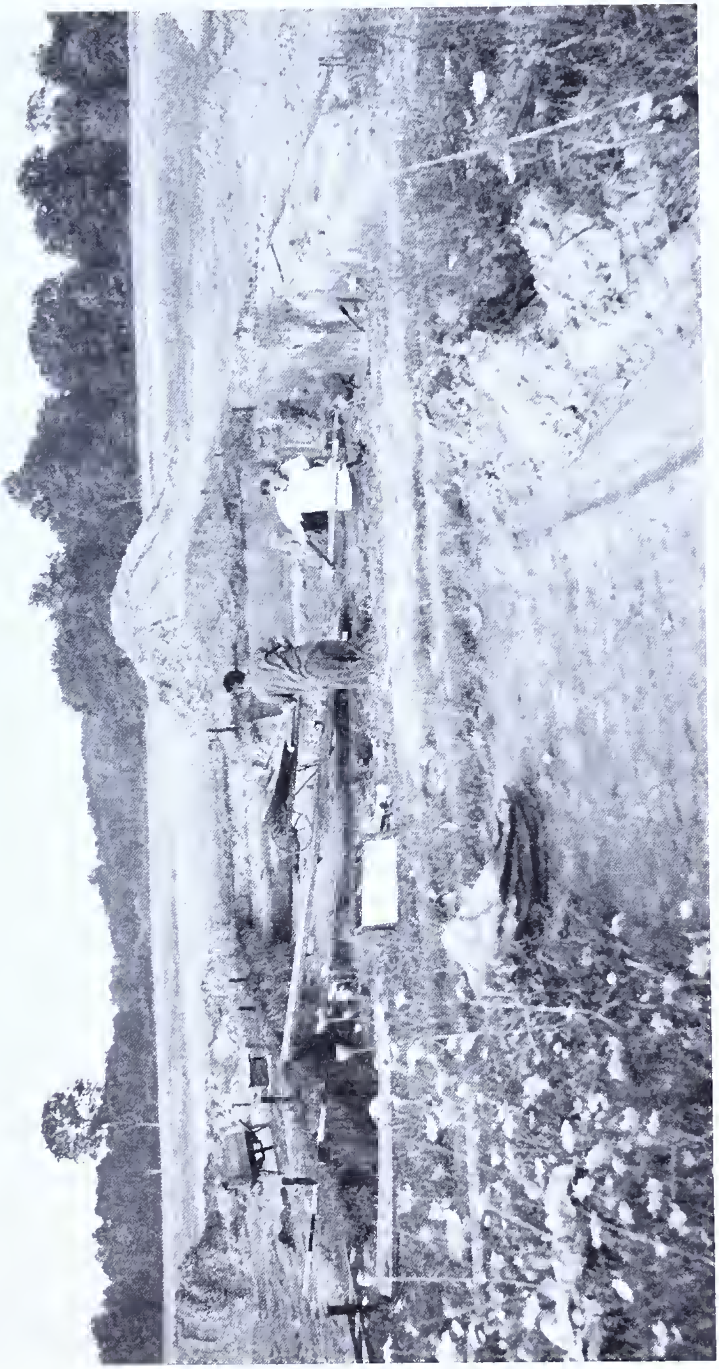

Fig. 20. GENERAL EXCAVATION SCENE OF THE ZIMMERMANN SITE, 1962, Section 1, showing the original grid, 40 feet by 100 feet.

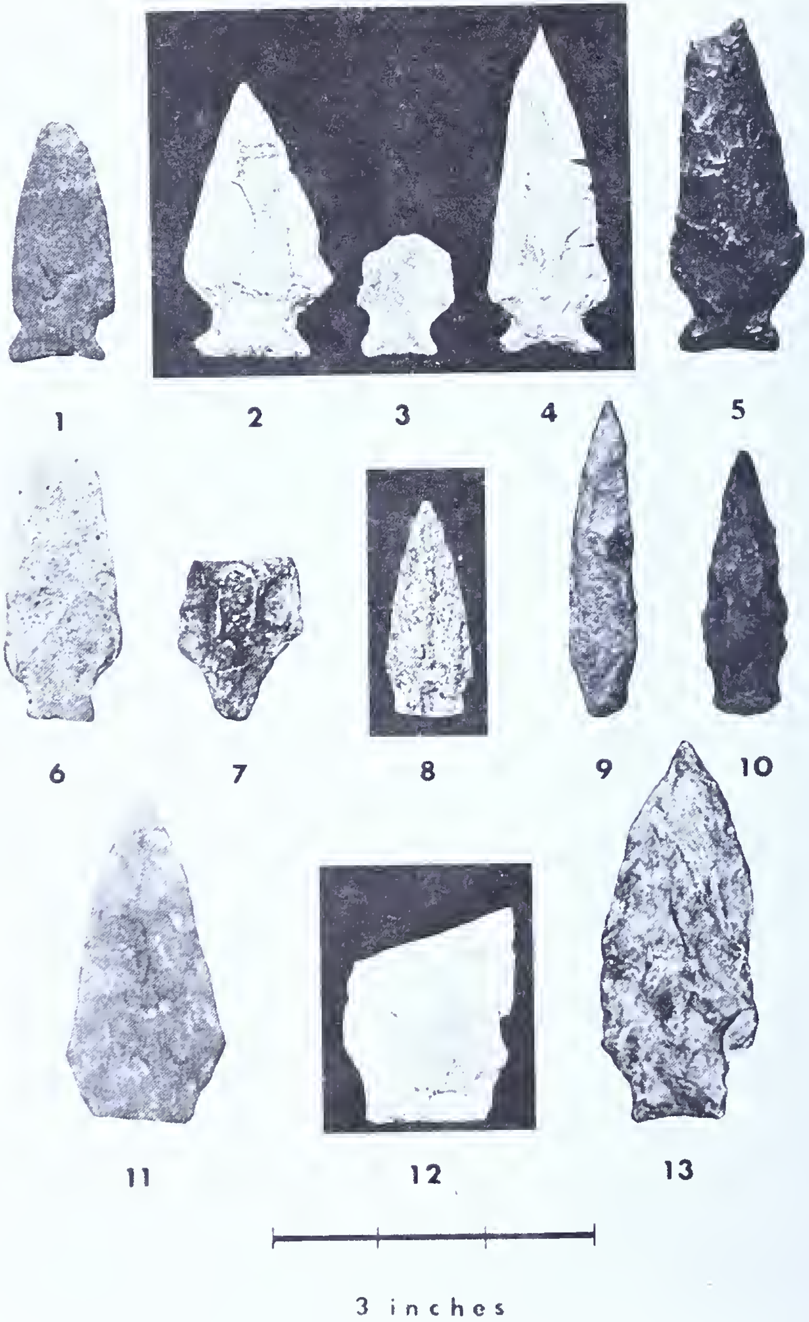

Fig. 21. ARTIFACTS FROM LEVEL 4 AT THE ZIMMERMANN SITE: 1, Susquehanna broad spear, reddish argillite; 2, 4, Susquehanna broad spears, rhyolite; 3, Susquehanna broad spear, argillite; 5, Susquehanna broad spear, chert; 6, 7, 9, Lackawaxen Stemmed point, argillite; 8, Lackawaxen Stemmed point, rhyolite; 10, Lackawaxen Stemmed point, flint; 11, pentagonal blank, reddish argillite; 12, 13, pentagonal blanks, rhyolite.

Bowl Fragments	193	
Estimated 32 vessels		(Fig. 26, Nos. 1, 2)
Miscellaneous		
Limonite (lumps)	8	(Fig. 24, No. 18)
Hematite (lumps)	3	(Fig. 24, No. 21)

Exclusive of the stone bowl fragments the total inventory was 592 artifacts.

The newly recognized Dry Brook (Fig. 23, Nos. 1-16, 19, 20) point type (refer to pages 430-2) in the Appendix for a description), in association with fragments of soapstone vessels as well as numerous other traits, represents the Dry Brook component and provides the foundation for establishing the Dry Brook phase of the Fishtail tradition in the Upper Delaware Valley. The distribution of Dry Brook points encompassed all of Level 3. These projectiles occurred concentrated around numerous features and scattered throughout the entire area. A few of the more significant areas of concentration and the important associations are discussed.

Forty-two points were found in association with four refined blanks, two flint strike-a-lights, four drills (two expanded base and two fishtail base forms), a polished celt, two utilized flakes, a soapstone pendant, and three soapstone bowl fragments. These items were located between Features 134 and 317, Section 3, and Feature 247, Section 4. Feature 42, a hearth, contained fragments of a flat-bottomed soapstone vessel (Fig. 26, No. 2), an end portion of another soapstone vessel, and a Dry Brook point. Feature 44 held two Dry Brook points (Fig. 23, Nos. 2, 3), a soapstone lug handle, an incised soapstone rim (Fig. 27, No. 2) and a refined blank.

Most of the material used in the manufacture of Dry Brook points is a dull, dark gray Onondaga chert. Occasionally, color variations occur in the form of medium gray, gray and tan, and bluish-gray. Waste chippage and unfinished specimens indicate the use of locally found glacial pebbles. Several blanks of bluish-gray chert with no evidence of pebble rind may have come from a more distant source (Wray 1948: 41). Numerous matching fragments of points in various stages of completion were found in workshop areas throughout the site.

Resharpened points are infrequent (Fig. 24, Nos. 1, 2). However, broken points were often reworked to form other tools, and some of the broken points were used as strike-a-lights without rechipping.

Scrapers

Scraping tools are rare. The diagnostic type for this component is represented by six projectile points or points broken in the process of manufacture which have been chipped on both faces (Fig. 24, Nos. 3, 4). They exhibit heavy wear on one side only. Four additional

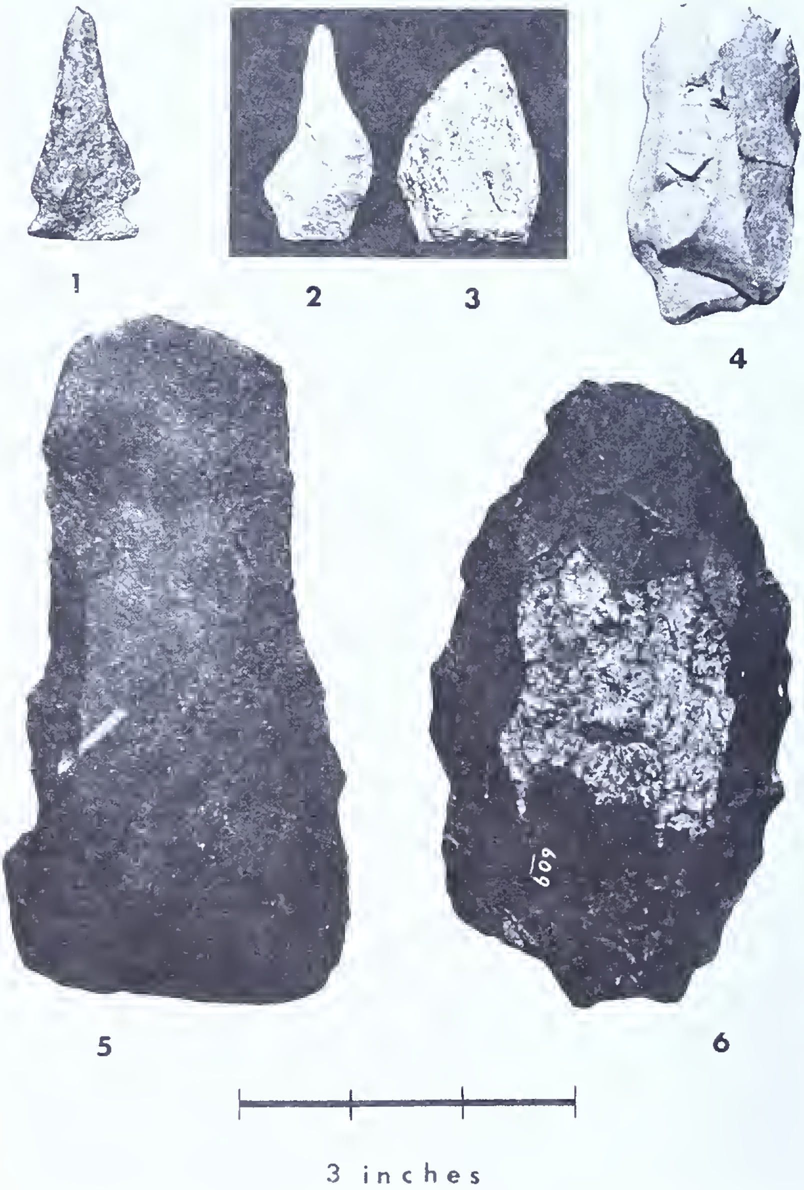

Fig. 22. ARTIFACTS FROM LEVEL 4 AT THE ZIMMERMANN SITE: 1, drill or reamer, reworked Susquehanna broad spear, rhyolite; 2, drill, reworked Lackawaxen Stemmed point, argillite; 3, pentagonal knife, rhyolite; 4, quarry blank, argillite; 5, spade-shaped chopper, sandstone; 6, oval chopper, black siltstone.

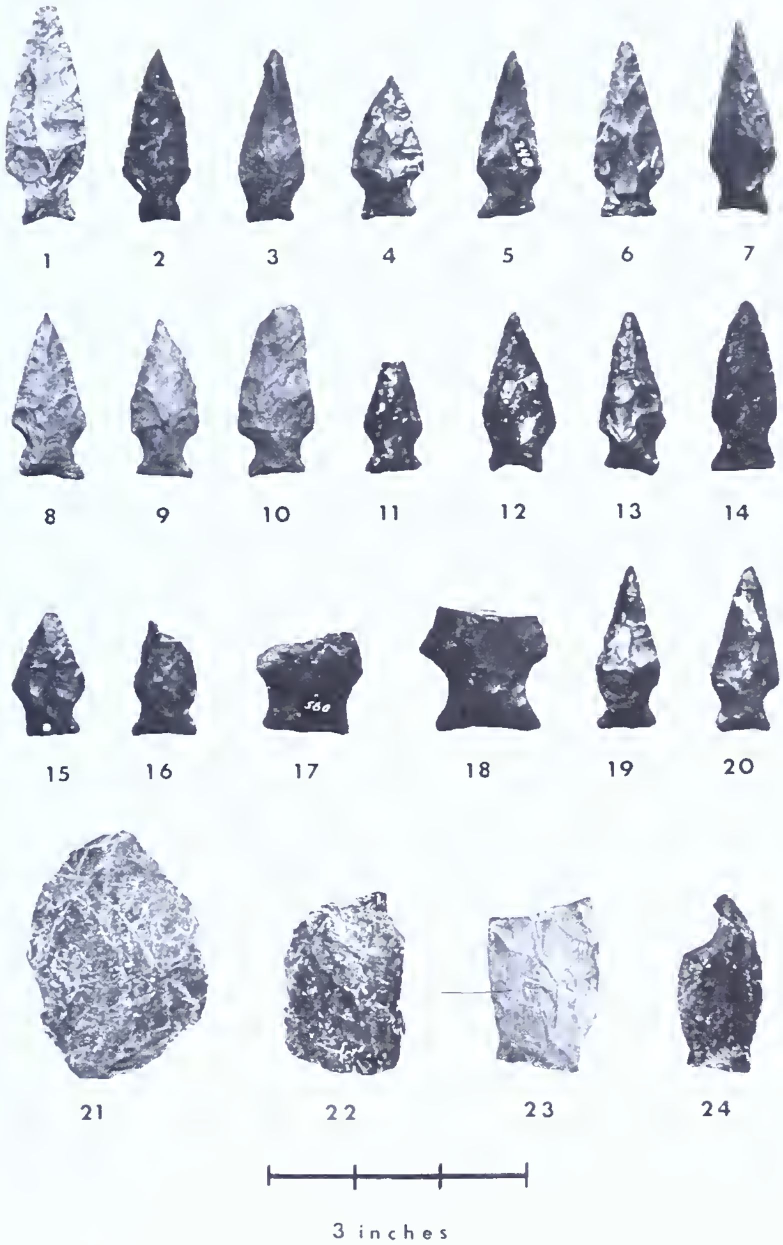

Fig. 23. ARTIFACTS FROM LEVEL 3 AT THE ZIMMERMANN SITE: 1, 3-5, 7-11, 13, 15, 16, 20, Dry Brook fishtail points, gray chert; 2, 12, 14, Dry Brook fishtail points, black flint; 6, 19, Dry Brook fishtail points, gray and tan chert; 17, basal section of semilozenge-shaped point, gray and tan chert; 18, basal section of semilozenge-shaped point, gray and black chert; 21, 22, 24, stage of production of fishtail points, black flint; 23, stage of production of fishtail point, gray chert.

specimens in various stages of completion may represent the type in process. One of these four has a narrow, bifacially chipped straight edge, which is a rare form in the Susquehanna phase. Witthoft (1953: 11) suggests that this form may have been an emergency tool or perhaps a different tool form. If this specimen had been hafted, it might have served as a chisel for gouging and splitting bone and wood.

Other scraper forms consist of thick flakes (3), deliberately chipped along one edge (Fig. 24, No. 12), and utilized flakes (42). The latter were of free form, irregular in shape, and of varying thickness. One edge and, on occasion two, exhibit minute flake scars. Experimentation indicates that these scars could be easily duplicated by scraping or cutting bone and wood. Edges may be straight, concave, or slightly convex.

Drills

Two types of drills or perforators were found and both were apparently designed for specific jobs, although the location of the specimens did not provide evidence of their function. One type (Fig. 24, No. 10) was made from broken fishtail points, and in one case from a complete point or blank. Each of these 16 specimens is fashioned from dark gray chert and has the distinctive fishtail base. They are similar to their rhyolite counterparts in that these were used to drill repair holes in cracked soapstone vessels and probably used to perforate beads, pendants, and gorgets. Heavier wear on some specimens may indicate the drilling of harder materials.

The second type is a long, slender drill with an expanded base. Two complete specimens measure 2.88 inches in length, and a third (Fig. 24, No. 9) measures 2.75 inches. The length of these specimens suggests they were designed for drilling thicker materials. There were 15 additional distal and median fragments.

Knives

Cutting tools are represented by two and possibly three types. Five projectile points (Fig. 24, No. 7) including one reworked specimen (Fig. 24, No. 8) exhibit wear on one or both edges. Figure 24, No. 17 is a prismatic flake of dark gray chert used as a knife. A total of 42 utilized flakes were found to show edge wear, and these have scars that are attributed to use as knives or scrapers. Five triangular bifaces (Fig. 24, No. 11) are tentatively placed in this category since they are smaller and thicker than the average refined blank. These lack the edge wear common on the projectile points. Similar specimens were present at the Stony Brook site (Ritchie 1959: 34, Pl. 22, Nos. 21-26).

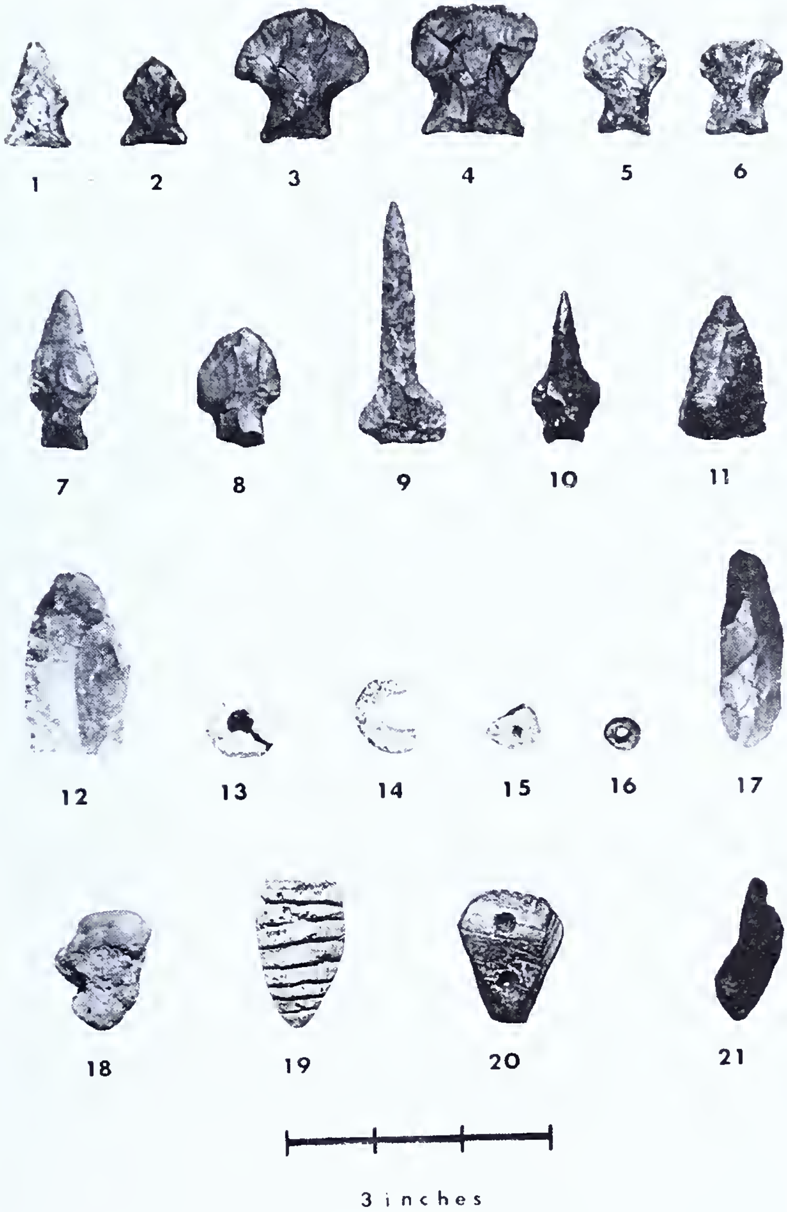

Fig. 24. ARTIFACTS FROM LEVEL 3 AT THE ZIMMERMANN SITE: 1, reshaped point, gray chert; 2, reshaped point, gray and tan chert; 3, 4, scrapers, from modified point, gray chert; 5, 6, strike-a-lights from broken point, gray chert; 7, 8, fishtail points used as knives, gray chert; 9, drill, expanded base, gray chert; 10, drill, modified fishtail, gray chert; 11, triangular knife (?), gray chert; 12, side scraper, gray and tan chert; 13-16, soapstone beads; 17, flake knife, gray chert; 18, limonite (altered pyrite ?); 19, 20, soapstone pendants; 21, hematite.

STRIKE-A-LIGHTS

Fire-making sets consisting of strike-a-lights and a form of altered sulphide were found near Features 81, 208, and 399. One strike-a-light with adhering limonite occurred near Feature 383. A total of 23 of these tools were unearthed, of which 21 specimens are basal fragments of fishtail points (Fig. 24, Nos. 5, 6) and the remainder are thick spalls. Each of these is considerably battered and worn.

CELTS

Nine celts were found in Level 3 of which two specimens were chipped (Fig. 25, No. 9) and the remaining specimens were ground (Fig. 25, No. 8). Celts are small (under five inches) and made of local siltstone. Three are slightly modified siltstone pebbles with ground edges, while others (bit portions) were carefully shaped and ground. One is rectangular in cross section while another has slightly beveled edges. Two ground specimens were associated with hearths in the eastern portion of Section 2, two with Feature 124 in the eastern end of Section 3, one with Feature 217, and one in the southern end of Section 3. One chipped specimen (Fig. 25, No. 9) was found near Feature 101 and the other similar example was near Feature 394.

ADZE

One fragmentary adze was found (Fig. 25, No. 10) and its surfaces are blackened and burnished with charcoal. It was found with three fishtail points, a scraper, a flint strike-a-light, and four soapstone bowl fragments near Feature 17 in Section 2. The adzes and celts are made from siltstone.

CHOPPERS

Seven large, irregular spalls of siltstone and sandstone, each with a sharp edge, were apparently used as chopping, cutting, or scraping tools, as evidenced by their battered and worn edges. They range in length from 4 inches to 10 inches. These resemble the teshoa (Eyman 1968), and their general characteristics suggest fortuitous use of waste materials derived from the manufacture of other tools. One sandstone specimen reveals abrasions on the rind surface and may have been previously used as an anvil.

PICKS (?)

A single long, bifacially chipped, lanceolate tool of siltsone (Fig. 27, No. 1) with a small amount of wear on the edges and surface facets was found near Feature 119 with soapstone fragments, a fishtail point,

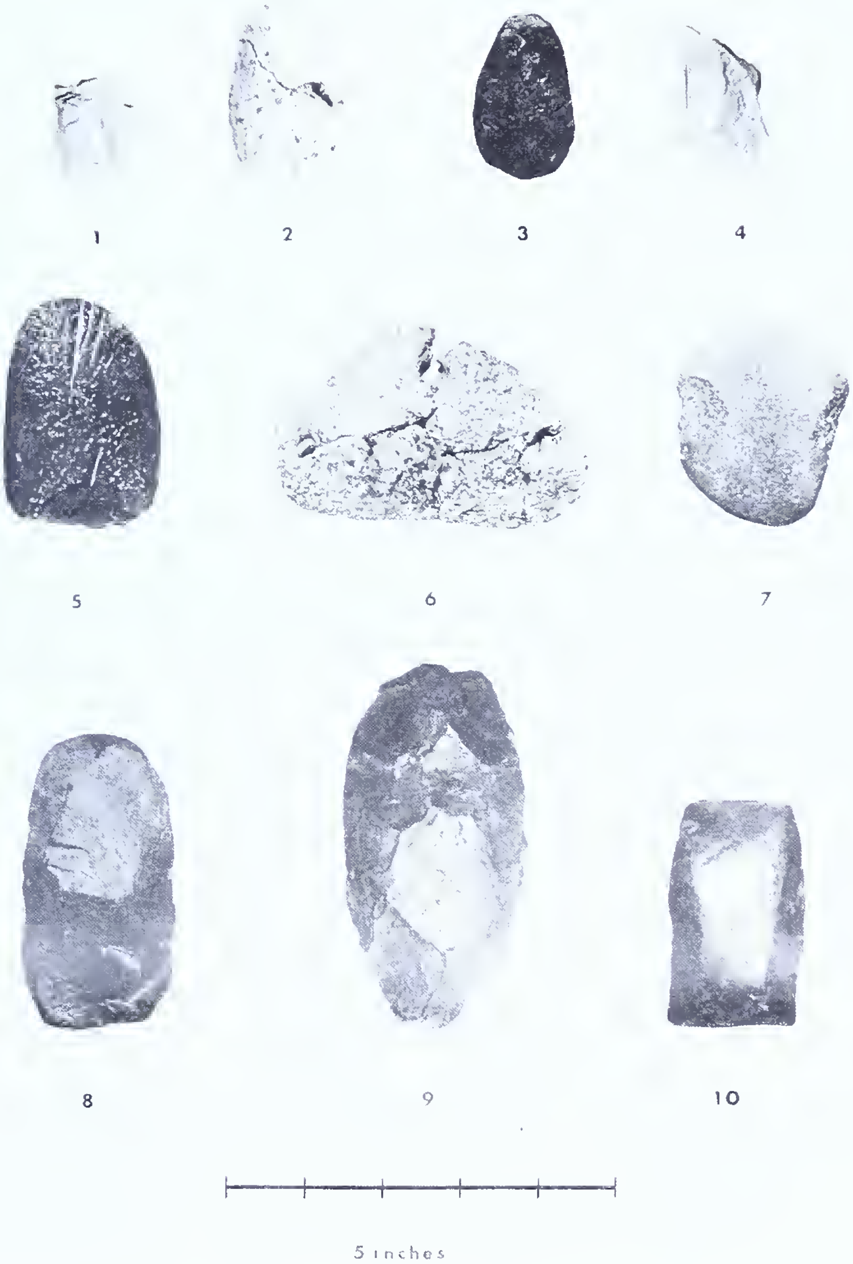

Fig. 25. ARTIFACTS FROM LEVEL 3 AT THE ZIMMERMANN SITE: 1, abrading stone, red shale; 2, grooved atlatl weight (?), soapstone; 3, ovate pendant (?), soapstone; 4, abrading stone, black siltstone; 5, abrading stone, sandstone; 6, gorget, soapstone; 7, netsinker, sandstone; 8, ground celt, black siltstone; 9, chipped celt, black siltstone; 10, ground plano-convex adze, black siltstone.

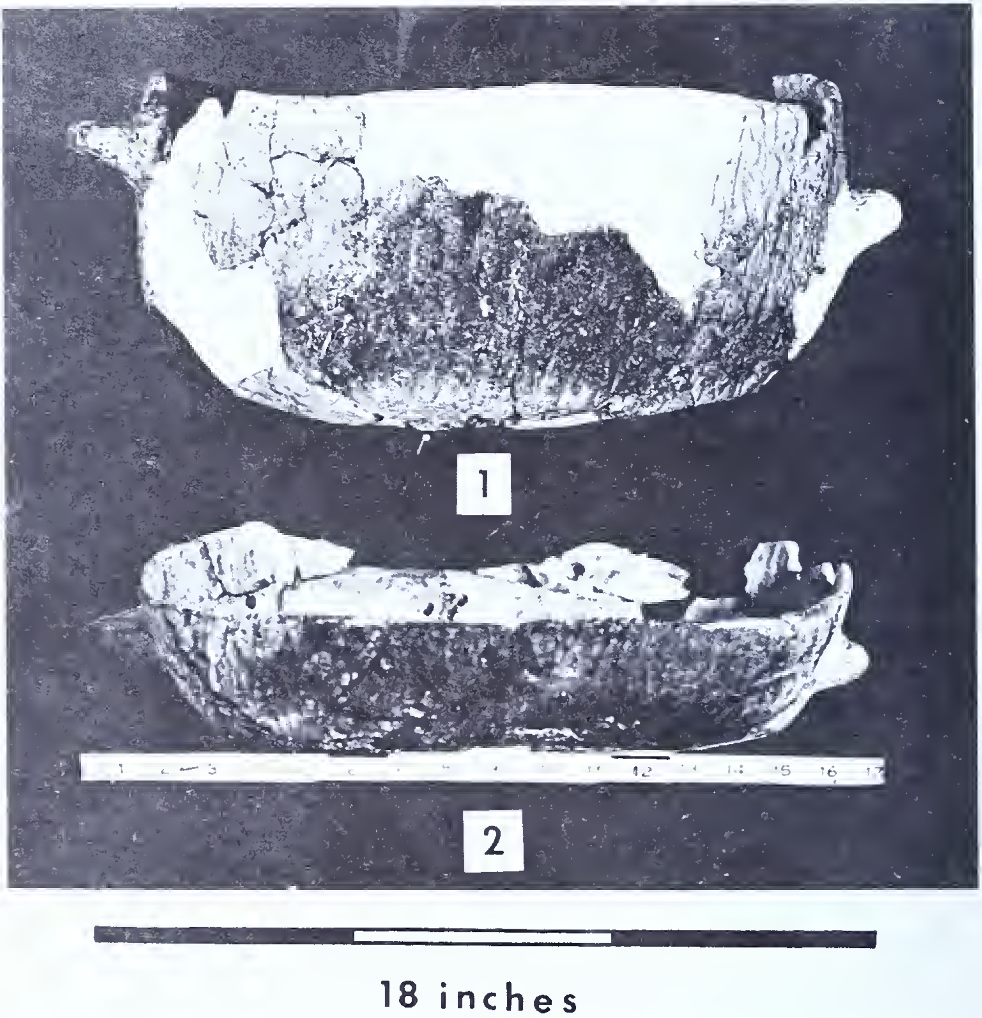

Fig. 26. SOAPSTONE VESSELS FROM LEVEL 3 AT THE ZIMMERMANN SITE.

an abrading stone, and the distal end of a drill. This specimen is six inches long by two inches wide and has a maximum thickness of 1.13 inches. Blade edges are thin and it is speculated that the object may have been used as a knife or pick. Some form of pointed tool, perhaps one similar to this specimen, was used to carve the soapstone vessel illustrated in Figure 26, No. 1. An unfinished pick (?) was found in the workshop area between Features 248 and 340, Section 4.

Hammerstones and Anvils

In view of the quantity of waste chippage, hammerstones were few in number. Ten specimens with varying amounts of battering on sides or ends were found. Usually these were located in areas containing workshop debris. One specimen was associated with Feature 89, Section 1; two specimens with Feature 293, Section 2; three specimens with Features 101, 120, and 125, Section 3; and four specimens with the workshop areas in the western half of Section 4 (Fig. 16). Three additional specimens were used as combined abrading or anvil stones.

There were six anvils including those used as combination tools. Five were unmodified flattened river pebbles, and they exhibit varying amounts of pitting and abrasion on the flat surfaces. One specimen had an odd pyramidal form with the top heavily abraded and rounded from use. This specimen was found near Feature 212, a large burned sand area measuring 60 inches by 26 inches, and nearby there was an unpitted hammerstone, fragments of soapstone vessels, particles of calcined bone, and numerous flakes of dark gray chert.

Abrading and Grinding Stones

The eleven specimens in this category were divided into four groups as follows:

Group 1. These are flat, thin, tabular, siltstone pebbles with one worn, rounded edge. Shallow grooves are present on the flat surfaces (Fig. 25, No. 4). They may have been used to grind projectile point

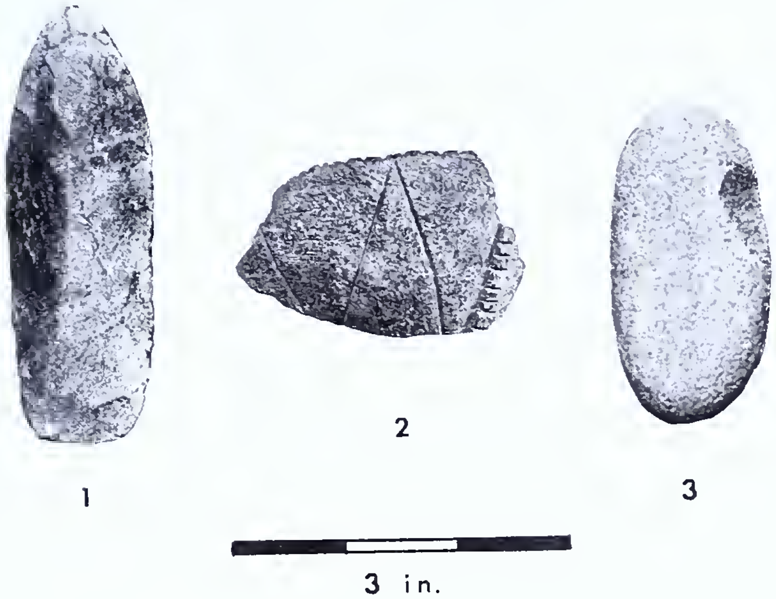

Fig. 27. ARTIFACTS FROM LEVEL 3 AT THE ZIMMERMANN SITE: 1, pick (?), siltstone; 2, incised soapstone bowl fragment; 3, hammerstone, sandstone.

bases and notches. One specimen was found near Feature 11, Section 1, and the remaining examples were found in the workshop area near Feature 340, Section 4. Similar specimens were present at the Mansion Inn and Vincent sites in Massachusetts (Dincauze 1968: 38-9).

Group 2. Scarified pebbles are small, oval pebbles of siltstone covered with fine striations (Fig. 25, No. 5). Two were found in Section 3 near Features 124 and 125 and two in Section 2 near Features 293 and 355 where they occurred with Dry Brook points, soapstone bowl fragments, and industrial debris of projectile point manufacture. They may have served the same purpose as those of Group 1.

Group 3. These are oval sandstone pebbles with broad, shallow grooves or traces of wear on one or more edges. They may have been used in grinding and shaping edges of celts or adze blades. One example occurred in the workshop area near Feature 207, Section 4, and the other near Feature 381, Section 2.

Group 4. Combination hammer and abrading stones indicate use as pecking and grinding tools. A reddish stain on one specimen suggests possible use in grinding ochre.

NETSINKERS

Seven notched pebbles (two siltstone and five sandstone) were found throughout Level 3. Notches on these flat pebbles were formed by striking blows from one side of the pebble edge and were then abraded to smooth the sharp edges (Fig. 25, No. 7).

MORTARS

The only evidence of food grinding by the Dry Brook people was a single large, flat, sandstone cobble with a slightly concave and abraded surface, found on the edge of Hearth 44 (Feature 192).

ORNAMENTS

Eleven objects, all fashioned from soapstone vessel fragments, are items of personal adornment. A single, three-hole gorget (Fig. 25, No. 6), restored from six fragments, was found scattered over two squares in the east end of Section 2. The specimen was made from a bowl fragment with smooth surfaces and was carved to semilunar shape, ground smooth, and perforated at the top and sides.

Two, possibly three, pendants of as many different styles were found. One is oval in outline and has a narrow groove around the edge (Fig. 25, No. 3). It is made from a soapstone fragment with a carved outer surface and may represent an incomplete form. Another pendant is triangular in outline and had been cut from a stone bowl rim fragment. The cut-mark is still visible (Fig. 24, No. 20). A single perforation occupies the broad end, and notching is present on the edge above the perforation which was originally the lip. The third fragmentary specimen has an elliptical outline, and is segmented by numerous narrow incisions (Fig. 24, No. 19). The missing end may have contained a single perforation, but due to its fragmentary nature it is impossible to determine the original form.

Seven beads were located, and of these, two are thin, irregular in outline, and with polished surfaces and very small perforations (Fig. 24, No. 15). Three specimens are round in cross section and they are exceptionally well made (Fig. 24, No. 16). Their small size contrasts with the thick doughnut-like, perforated objects found on sites of the Susquehanna broadspear culture (Witthoft 1953: 12). One specimen is barrel-shaped and is restored from two fragments found near Feature 208, Section 4 (Fig. 24, No. 13). A fragmentary specimen (Fig. 24, No. 14) found near Feature 209, Section 4, has the shape of a flat washer.

SOAPSTONE VESSEL FRAGMENTS

A total of 193 soapstone vessel fragments (58 rims and 135 body fragments) represents an estimated 32 vessels. Two vessels have rough exterior tooling, 15 exhibit narrow chiseled grooves, and five have smooth surfaces.

Vessel forms are as follows:

1. This is a shallow, elongated form with outsloping sides, a flat bottom, a smooth interior surface, and finely chiseled exterior (Fig. 26, No. 2). Chisel marks indicate a sharp-edged tool with one-half-inch bit was used to work the surface. The lugs taper and have two deeply incised, crossed lines on the under surface, which probably served to provide a firmer grip. Top edges of the lug and the lip bear a series of narrow notches. This vessel, restored from 22 fragments, measures 19 inches long by 10 inches wide and 5 inches high. The central portion of the base is completely burned out, and this condition is attributed to the flaking off of the brittle base from its continuous use on hot stones. Numerous repair holes indicate repeated efforts to preserve the vessel. The color is medium gray and the texture is fine. The vessel was found with Vessel 2 and a fishtail point in Feature 42, Section 1.

2. Five sherds comprise the restored end section of a bowl of unknown shape and dimension. The fractured basal edge has been

smoothed, and its continued use as a small vessel is indicated by the charcoal-smudged sides. It has a boat-shaped appearance. Interior and exterior surfaces are smooth, with notches present on the lip. There is no evidence of a lug. The color is medium gray with some pinkish areas. There is no physical evidence to indicate how this sturdy end section was broken. It measures 8 inches long by 4.63 inches wide and 2.75 inches high.

3. A large, oval, tub-shaped vessel, partially restored from 52 fragments, has vertical walls, a flat bottom, and a rounded lug (Fig. 26, No. 1). The lip of the vessel is notched but most of the notches are obliterated by wear. The lug has deeply incised lines on the upper surface and edge. The length of the vessel is estimated to be 20 inches, the width 10 inches, and the height about 8 inches. The exterior is carved and deep striations suggest that these were formed by a pointed tool (pick?) perhaps similar to the specimen illustrated (Fig. 27, No. 1). The interior exhibits the same tooling marks, but these have been mostly obliterated by smoothing. The vessel is made from a poor grade of soapstone with porous areas and impurities. Numerous particles of magnetite are visible on the surface. The color is predominantly medium gray with small areas of tan and pink. The base is charred on the interior surface, and the evenness of this charred layer suggests burned food remains; a black smudge is present on the exterior of the vessel.

4. Seven fragments comprise a portion of the base and side of a vessel of unknown size and form, although the curvature of the section indicates an oval outline. Basal fragments measure one inch in thickness, while the sides have a maximum thickness of .63 of an inch. The walls are slightly excurvate and out-sloping. The base is flattened, but it is part of the rounded outline between side and base. This contrasts with Vessels 1 and 3 whose sides and bases form obtuse angles. Both interior and exterior surfaces are smooth. Color is medium gray and the material is rather fine grained. A light charcoal smudge is present on the basal portion. Five perforations (two are incomplete) are present on the side and basal edge. One perforation was crudely gouged out from both sides with an unknown tool, and the others were made with a drill.

5. Approximately one-half of a small cup or ladle was found in Hearth 11 (Feature 75). Both surfaces are smooth, the lip is notched, and color and texture are the same as Vessel 4.

6. Six rim and 14 body fragments comprise an end section of a vessel with a carved exterior and smooth interior. A small, rounded

lug protrudes three-quarters of an inch from the body. The contour of the section indicates a possible round or wide-oval vessel. The estimated length and width is 14 inches and 12 inches respectively, and the height is 6 inches. The junction of the sloping side and flat bottom form an obtuse angle in cross section. The broken edges of the side and bottom have been smoothed, the basal area is charred and burned through, and the color is light gray with a few pinkish areas. This vessel resembles Number 2 in that it continued in use as a small vessel after reshaping and smoothing of the broken edges.

7. Two rims and six body fragments were restored to form a section of the side and base of one vessel. Height is eight inches, but the length and width remain unknown. The exterior surface has been shaped by a narrow chisel, and the juncture of the base and outsloping side has the usual sharp break in contour. Three pairs of repair holes are present along the side and each was drilled from the exterior. The basal portion and sides are smudged with charcoal, the color is medium gray, and cut marks on opposite surfaces indicate where fragments were removed. The latter suggest that large fragments were cut into smaller pieces to make ornaments or other objects.

Level 2

Clear stratigraphy in this level of Sections 3 and 4 is not evident, and the horizontal pattern of features and artifacts suggests the presence of several components. On the basis of information gleaned from this site and for similar archeological manifestations elsewhere in the Northeast, particularly the Upper Delaware Valley, five components appear to be represented. The material culture is as follows:

Pottery Types	*Rims*	*Body Sherds*	*Temper*	*Estimated Number of Vessels Present*	
Vinette 1	12	126	crystalline grit with quartz	5	(Fig. 28, Nos. 1-4)
Modified Interior Cord-Marked	3	98	crystalline grit with quartz	3	(Fig. 28, Nos. 5, 6)
Exterior Corded/ Interior Smoothed Redware	21	191	white quartz	5	(Fig. 28, No. 9; Fig. 29, No. 4)
Exterior Corded/ Interior Smoothed Buffware	5	64	white quartz	4	(Fig. 28, Nos. 7, 8)
Wiped	14	47	crystalline grit with quartz	2	(Fig. 28, No. 12)

Dentate Stamped	1	16	white quartz	1	(Fig. 28, Nos. 10, 11)
Point Peninsula Corded	6	14	white quartz	2	(Fig. 29, No. 1)
	62	556		22	

Total sherds: 618

Chipped Stone

Orient Fishtail Points		8	(Fig. 30, Nos. 17-19)
Meadowood		16	(Fig. 30, Nos. 22, 23)
Jack's Reef Corner-Notched		1	(Fig. 30, No. 10)
Jack's Reef Pentagonal		3	(Fig. 30, Nos. 20, 21)
Lagoon		5	
Rossville		2	(Fig. 30, Nos. 14-16)
Generalized Side-Notched		5	(Fig. 30, Nos. 3, 9)
Corner-Notched		2	(Fig. 30, Nos. 1, 2)
Narrow Stemmed		3	(Fig. 30, Nos. 11, 12)
Contracting Stemmed		5	
Broad Stemmed		8	(Fig. 30, Nos. 4-8, 13)
Rejects		7	
Quarry Blanks, Crude		7	(Fig. 30, Nos. 36, 37)
End Scrapers		16	
Flake	6		(Fig. 30, No. 25)
Spall	6		
Triangular (point tip)	2		(Fig. 30, No. 24)
Turtleback	1		
Core	1		
Drills		12	
Reworked Meadowood Point	4		(Fig. 30, No. 31)
Side-Notched	4		
Square Base, Cache Blade	1		(Fig. 30, No. 32)
Reworked Jack's Reef Corner-Notched	1		(Fig. 30, No. 30)
"T"—Shaped	1		(Fig. 30, No. 33)
Expanded Base	1		
Knives		18	
Biface	10		
Flake	5		(Fig. 30, No. 38)
Prismatic Flake	2		
Ground, Siltstone	1		(Fig. 31, No. 7)
Cache Blades, Thin Triangular		3	(Fig. 30, No. 35)
Strike-a-lights		3	
Spall	2		(Fig. 30, No. 27)
Fishtail	1		(Fig. 30, No. 28)
Graver/Scraper		2	(Fig. 30, No. 34)
Celt		1	
Netsinkers		16	
Pebble, Large Notched	9		(Fig. 31, No. 6)
Pebble, Oval, Pecked	4		(Fig. 31, Nos. 1, 3)
Pebble, Round, Pecked, Notched	3		
Chopper		3	

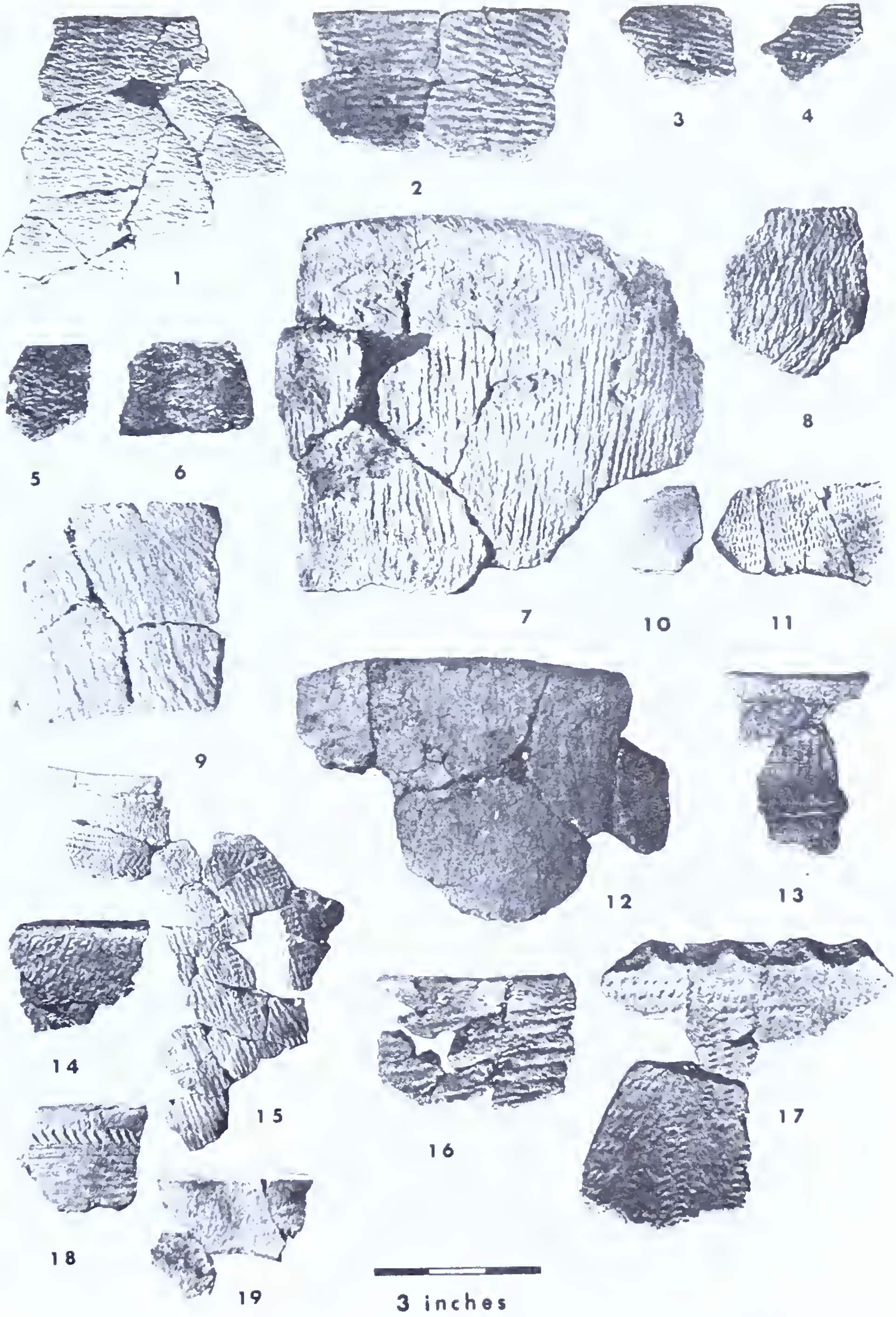

Fig. 28. RIM SHERDS FROM LEVELS 2 AND 1A AT THE ZIMMERMANN SITE: 1-3, Vinette 1, Level 2; 4, Vinette 1 (interior), Level 2; 5, Modified Interior Cord-marked, Level 2; 6, Modified Interior cord-marked (interior), Level 2; 7, 8, Exterior Corded/Interior Smoothed (buffware), Level 2; 9, Exterior Corded/Interior Smoothed (redware), Level 2; 10, 11, Dentate-Stamped, Level 2; 12, Wiped, Level 2; 13, 15, 16, Carpenter Brook Cord-on-Cord, Level 1A; 14, Jack's Reef Corded, Level 1A; 17, Clemson Island Punctate, Level 1A; 18, Owasco Corded Horizontal, Level 1A; 19, Levanna Cord-on-Cord, Level 1A.

Ground and Polished			
Celt, Fragmentary (?)		1	
Adze		1	(Fig. 31, No. 8)
Pendant, Banded Slate		1	(Fig. 31, No. 2)
Altered by Usage			
Abrading Stones		3	(Fig. 30, No. 39)
Anvil		2	
Anvil/Hammerstone Combination		1	
Hammerstones		20	
Single Pit	6		
Bipitted	7		
Unpitted	6		
Small Pebble	1		
Maul		1	(Fig. 31, No. 5)
Mortar		2	
Multipitted Boulder		1	
Scarified Pebble		2	
Sinewstone		1	(Fig. 31, No. 4)
Miscellaneous			
Limonite (lump)		1	(Fig. 30, No. 29)

Although it is difficult to determine the actual cultural content for each component, some observations and generalizations regarding specific associations are possible.

Artifacts—Level 2

Early Woodland, Middle Woodland

Features 102, 116, and 387 were related to the Meadowood phase and the presence of this Early Woodland expression in the top of Zone 3 is distinguished largely by the presence of the diagnostic Meadowood point. Sixteen specimens were found and these represent the majority point type in Level 2 (Fig. 30, Nos. 22, 23). Three specimens were made of dark gray chert, while the remainder were of the characteristic gray and tan Onondaga chert from western New York.

Features 102, 116, and 387 represent three closely associated basin-shaped hearths. Feature 116 contained one unpitted hammerstone, a large sharp-edged siltstone spall, a basal fragment of a Meadowood point, a multipitted cobblestone, and eight charred walnut shell fragments. Other specimens found near the three hearths include a tabular whetstone, two triangular end scrapers of Onondaga chert (Fig. 30, No. 24); two Meadowood points; a broken, ground slate knife; (Fig. 30, No. 7); a bipitted stone; and an Orient fishtail point (Fig. 30, No. 19). The absence of pottery made impossible the determination of ceramic associations for the Meadowood component.

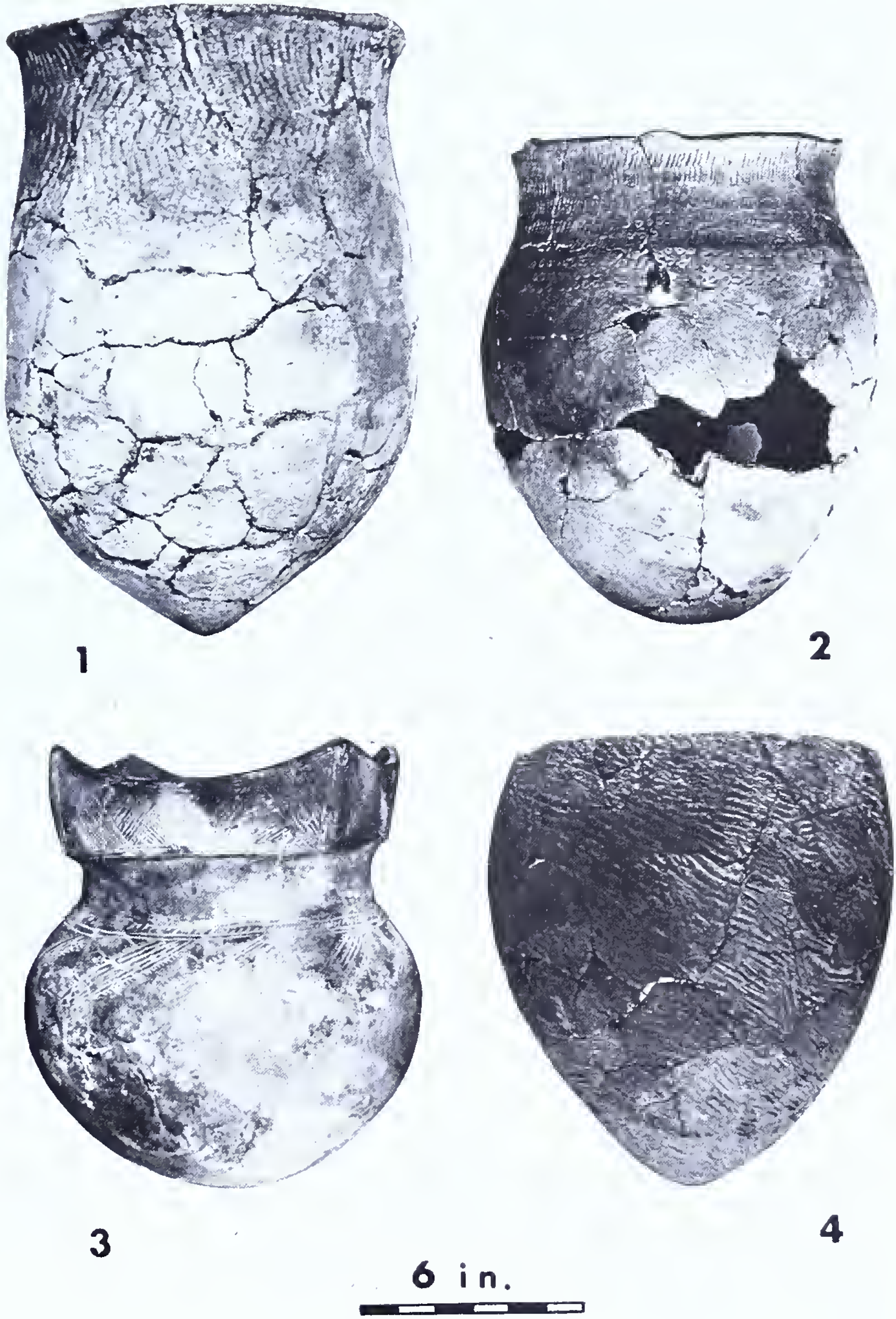

Fig. 29. RESTORED POTTERY VESSELS FROM THE ZIMMERMANN SITE: 1, Point Peninsula Corded, Level 2; 2, Platter Punctate, Feature 152; 3, Durfee Underlined, Feature 12; 4, Exterior Corded/Interior Smoothed (redware), Level 2.

A second group consisted of three hearths (Features 122, 131, and 137), and closely associated were a pentagonal point of argillite, a stemmed point of Flint Ridge chalcedony (Fig. 30, No. 11), a side-notched point (reject) of black flint, two flake knives (Fig. 30, No. 38) of brown jasper and gray chert, two flake end scrapers (Fig. 30, No. 25) of brown jasper and red jasper, a spall strike-a-light of red jasper, an ovate biface or quarry blank of argillite, a notched pebble, one netsinker, unpitted hammerstones, and two pitted hammerstones.

A third association consisted of two hearths and one pit (Features 138, 155, and 173), with most of the artifacts located in a small workshop area adjoining Features 138 and 155. Included are two Meadowood points of yellow jasper and gray chert, two thin cache blades or knives (Fig. 30, No. 35) of black flint, four ovate bifaces or quarry blanks (three black flint, one red jasper), one spall end scraper of dark gray chert, one flake end scraper of black flint, one abrading or whetstone (Fig. 30, No. 39) of reddish shale, one unpitted hammerstone, three rounded pebble netsinkers (Fig. 31, Nos. 1, 3) with pecked notches, and the major portion of a Point Peninsula Corded vessel (Fig. 29, No. 1).

A pentagonal point (Fig. 30, No. 21) of brown jasper and 54 sherds of Wiped pottery were closely associated with Feature 173. The pit, Feature 155, contained two Jack's Reef Corner-notched points, one of which was used as a drill (Fig. 30, Nos. 10, 30), and a triangular blank (Fig. 30, No. 37) of brown jasper.

A fourth association is represented by a single pit-hearth, Feature 250, in the center of Section 3. Eight small, broad-stemmed points of argillite and shale (Fig. 30, Nos. 4-8, 13) were found around this

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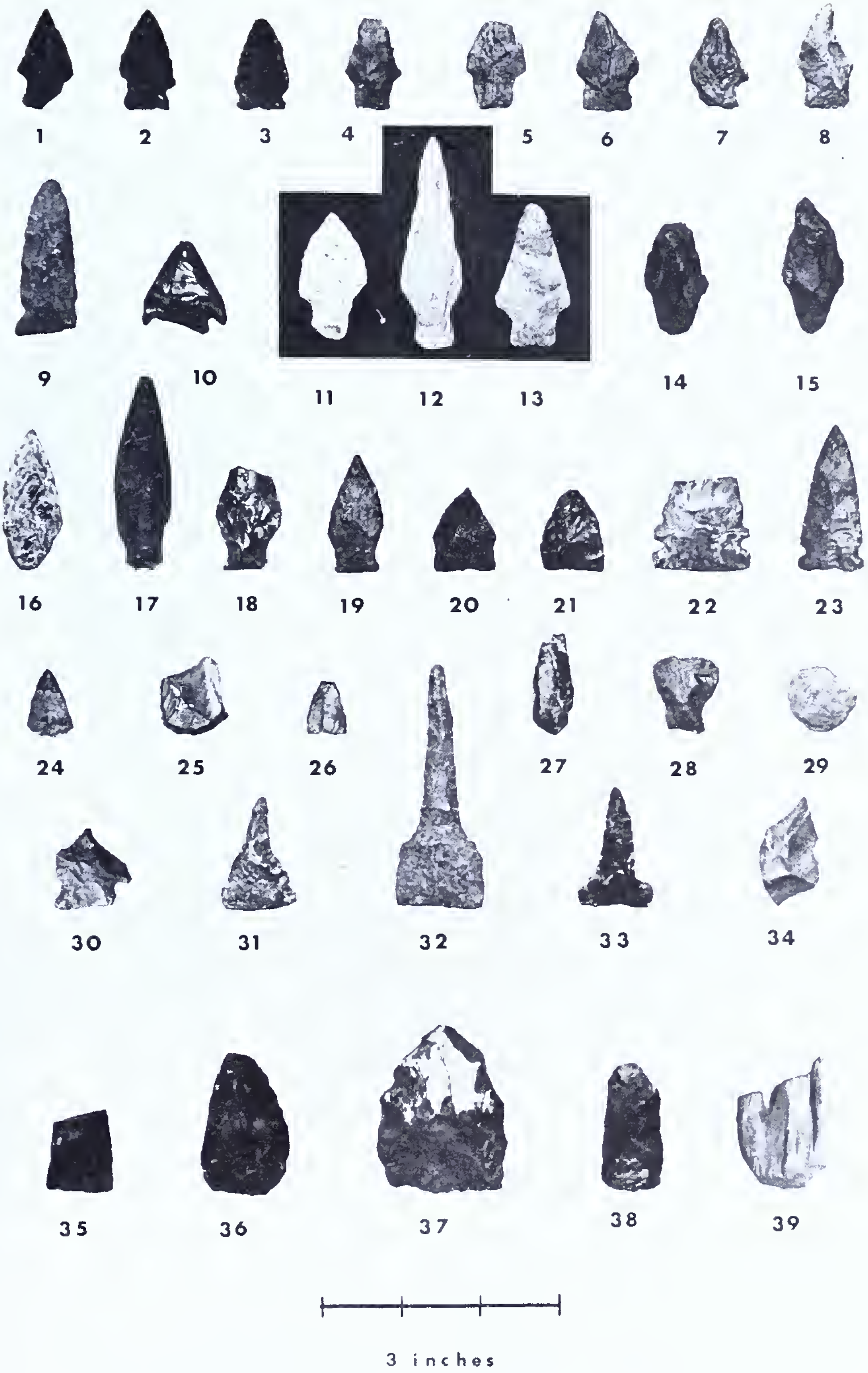
Fig. 30. ARTIFACTS FROM LEVEL 2 AT THE ZIMMERMANN SITE: 1, 2, corner-notched points, black flint; 3, generalized side-notched point, black flint; 4-8, 13, small broad-stemmed points, argillite; 9, generalized side-notched point, argillite; 10, Jack's Reef Corner-notched point, brown jasper; 11, narrow stemmed point, chalcedony; 12, narrow stemmed point, argillite; 14-16, Rossville points, argillite; 17, Orient Fishtail point, black flint; 18, 19, Orient fishtail points, brown jasper; 20, Jack's Reef Pentagonal point, black flint; 21, Jack's Reef Pentagonal point, brown jasper; 22, Meadowood point, Onondaga chert; 23, Meadowood point, gray flint; 24, triangular end scraper, Onondaga chert; 25, flake end scraper, brown jasper; 26, utilized flake, Onondaga chert; 27, strike-a-light spall, black flint; 28, strike-a-light point, red jasper; 29, limonite; 30, drill-tipped Jack's Reef Corner-notched point, brown jasper; 31, drill, reworked Meadowood point, Onondaga chert; 32, drill, cache blade, Onondaga chert; 33, "T"-shaped drill, black flint; 34, graver-scraper, brown jasper; 35, triangular cache blade, black flint; 36, crude quarry blank, black flint; 37, crude quarry blank, brown jasper; 38, flake knife, gray flint; 39, abrading stone, shale.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hearth, and in the hearth and trampled into the surrounding clay were 46 small sherds with cord-marked interiors and flakes of argillite and shale. The assemblage may be a pure component, especially since the depth of the hearth in which the points and sherds were located was between 14 and 16 inches. The position of the hearth and artifacts within Zone 3 suggests a Level 2A, Middle Woodland occupation. This separation of Level 2 artifacts and features is discussed below.

A fifth assemblage consists of 15 features remaining in the western half of Sections 3 and 4, around which the heaviest concentration of artifacts occurred. Here was a mixture of projectile point types, including Meadowood, Orient, Rossville, Generalized Side-Notched, pentagonal, broad-stemmed, and contracting-stemmed types. End scrapers on flakes and spalls, drills (square base, expanded base, reworked Meadowood point, "T"-shaped and side-notched), knives (flake, biface, and prismatic flake), graver/scraper, utilized flakes, red jasper fishtail point striker, celts, adze, banded slate pendant, netsinkers (as much as 24 ounces in weight), and various rough stones were also found. Pottery types include Vinette 1 (Figure 28, Nos. 1-4), Modified Interior Cord-Marked (Fig. 28, Nos. 5, 6), Zimmermann Corded (red and buff) (Fig. 28, Nos. 7, 9; Fig. 29, No. 4) and Exterior Corded/Interior Smoothed (Fig. 28, No. 8).

An exception to this potpourri of artifacts and features was a small area of the site in the center of Section 2. It measured 40 feet by 60 feet and included three hearths and a pit with a stratified sequence of Level 2 features and tool types. The diversity of artifacts found in Sections 3 and 4, however, was not present. A large platform hearth, Feature 354, located at the junction of Zones 3 and 4, partially overlapped a Level 3 feature at a depth of 39 inches. In close association with this Level 2B feature were two Orient fishtail points, four rim sherds and 42 Vinette 1 body sherds representing a single vessel (Fig. 28, No. 1), a sinew stone (Fig. 31, No. 4), and fragments of two refined blanks. The remaining three features were found in Zone 3. This separation and comparison with artifacts from Level 2, Sections 3 and 4, provided the basis for the separation of Level 2 into Early Woodland (lower 2B) and Middle Woodland (upper 2A). A small pit with a mixture of charcoal-stained soil and broken stones, found immediately above the platform hearth at a depth of 24 inches, contained 47 body sherds of an Exterior Corded/Interior Smoothed vessel. This vessel is distinguished from others of this type by an absence of temper. It was constructed by coiling, and partial reconstruction indicates a conoidal base. The exterior surface is corded in a horizontal or slightly oblique fashion and the overall color is reddish-brown. Numerous flakes of argillite were recovered from this level

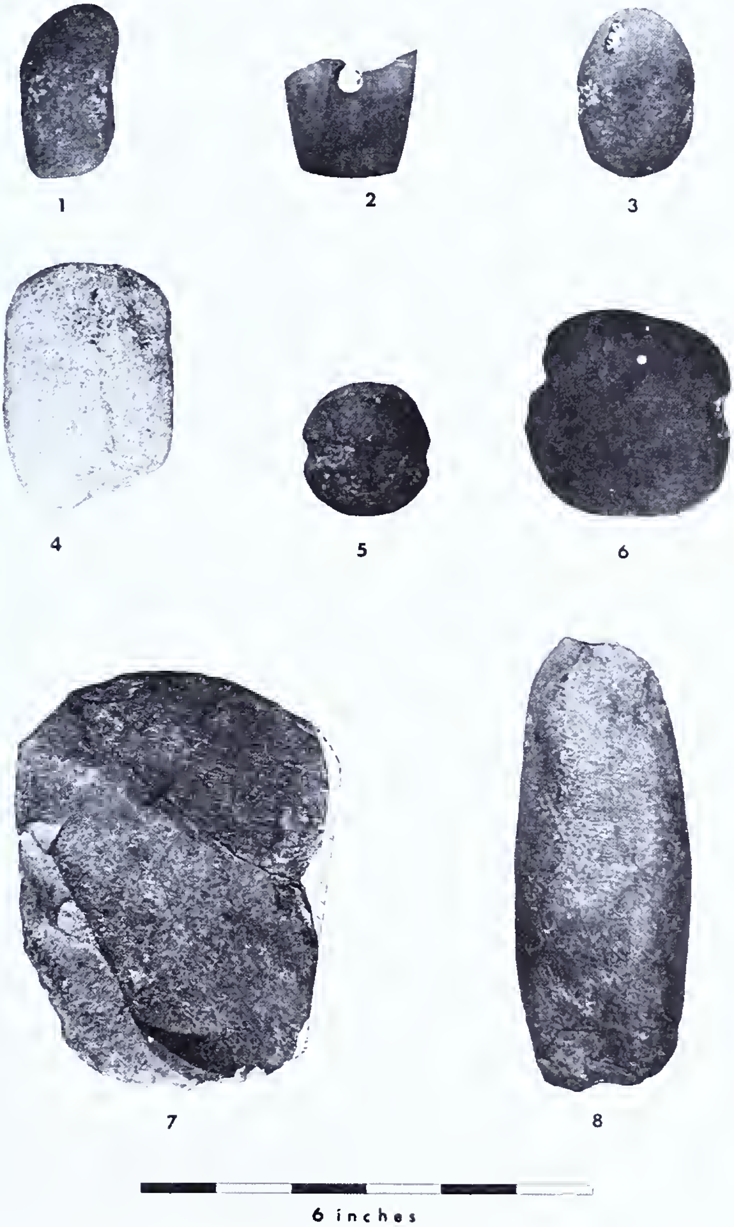

Fig. 31. ARTIFACTS FROM LEVEL 2 AT THE ZIMMERMANN SITE: 1, 3, pebble sinker (pecked notches), sandstone; 2, pendant fragment, banded slate; 4, sinewstone, sandstone; 5, grooved maul, sandstone; 6, notched netsinker, sandstone; 7, ground edge knife, siltstone; 8, plano-convex adze, siltstone.

surrounding the pit, and an argillite Rossville point was found among them (Fig. 30, No. 14).

Thirty-five feet east of this feature two hearths were found within Zone 3 at a depth of 30 inches (Features 288, 357). A Lagoon point and 76 sherds of fine Dentate-Stamped pottery (Fig. 28, Nos. 10, 11) were associated with Feature 357. A Lagoon point made of black flint was found near Feature 288 within a concentration of flakes and chipping debris. Several of these flakes are identical to those found in Sections 3 and 4 among Point Peninsula tools.

ARTIFACTS—LEVEL 1A

Late Woodland

Extending over 160 feet of the eastern end of Section 2 were four hearths, one pit, and one ash bed. These features were aligned along an east-west axis following the crest of the terrace. Scattered throughout these various features were 38 artifacts and 671 sherds representing an estimated 19 vessels of eight different types. Artifacts are listed below:

Pottery Types	*Rims*	*Body Sherds*	*Temper*	*Estimated Number of Vessels Present*	
Notched Lip	10	172	white quartz	1	
Jack's Reef Corded	11	90	crystalline grit with quartz	2	(Fig. 28, No. 14)
Jack's Reef Corded Punctate	24	103	white quartz	1	(Fig. 32, No. 8)
Clemson Island Punctate	6	25	black chert	2	(Fig. 28, No. 17)
Carpenter Brook Cord-on-Cord	18	172	white quartz with crystalline grit	4	(Fig. 28, Nos. 13, 15 16)
Levanna Cord-on-Cord	22	109	crystalline grit	5	(Fig. 28, No. 19)
Owasco Corded Horizontal	3	17	white quartz with black chert	3	(Fig. 28, No. 18)
Owasco Corded Oblique	1		white quartz	1	

Chipped Stone

Levanna		10 (Fig. 33, Nos. 1-3)
Lithic preference		
Chalcedony	8	
Gray Chert	2	

Quarry Blanks		13	
Knives		2	
Triangular	1		(Fig. 33, No. 7)
Tabular	1		(Fig. 34, No. 12)
Flake Graver		1	(Fig. 33, No. 5)
Side Scraper, Keeled		1	(Fig. 33, No. 8)
Utilized Flake		1	(Fig. 33, No. 6)
Netsinkers		5	
Scraper/Graver		1	(Fig. 33, No. 4)
Ground and Polished			
Celt, Triangular		1	(Fig. 34, No. 11)
Adze, Plano-Convex		1	
Altered by Usage			
Abrading Stone		1	(Fig. 33, No. 10)
Miscellaneous			
Clay Bead		1	(Fig. 33, No. 9)

Associations

Levanna points were associated with four of the six features. None were found near or in the ash bed, Feature 346, although 13 quarry blanks fashioned from gray chert were located on the northern edge of this feature.

A small triangular celt (Fig. 34, No. 11), five rim sherds and six body sherds of a small Levanna Cord-on-Cord vessel (Fig. 28, No. 19) and five rims and 60 body sherds of Carpenter Brook Cord-on-Cord (Fig. 28, No. 13) were found near Hearth 73. The Carpenter Brook sherds differ from other sherds of this type found near Hearth 79. The sherds (Fig. 28, No. 13) from Hearth 73 range in color from buff to black, have a slightly flattened, undecorated lip, and are tempered with a moderate amount of fine to medium (1 to 3 mm.) crystalline grit. Sherds associated with Hearth 79 are reddish-orange in color and have a sharply everted rim. The flat lip is cord-decorated as is the interior rim. Horizontal cord impressions have been applied to a smooth neck, and plats of short cord impressions extend from the shoulder over portions of the corded body (Fig. 28, No. 15).

The large ash bed contained Clemson Island Punctate (Fig. 28, No. 17) and Jack's Reef Corded sherds. Sherds of the latter type were also found with Owasco Corded Oblique and Owasco Corded Horizontal (Sackett Corded) on the northern edge of the bed. An argillite knife (Fig. 34, No. 12) was the only tool from the immediate area of this feature.

Several sherds of Jack's Reef Corded (Fig. 28, No. 14) were from Pit 167 in the center of Section 2. Two additional vessels were from

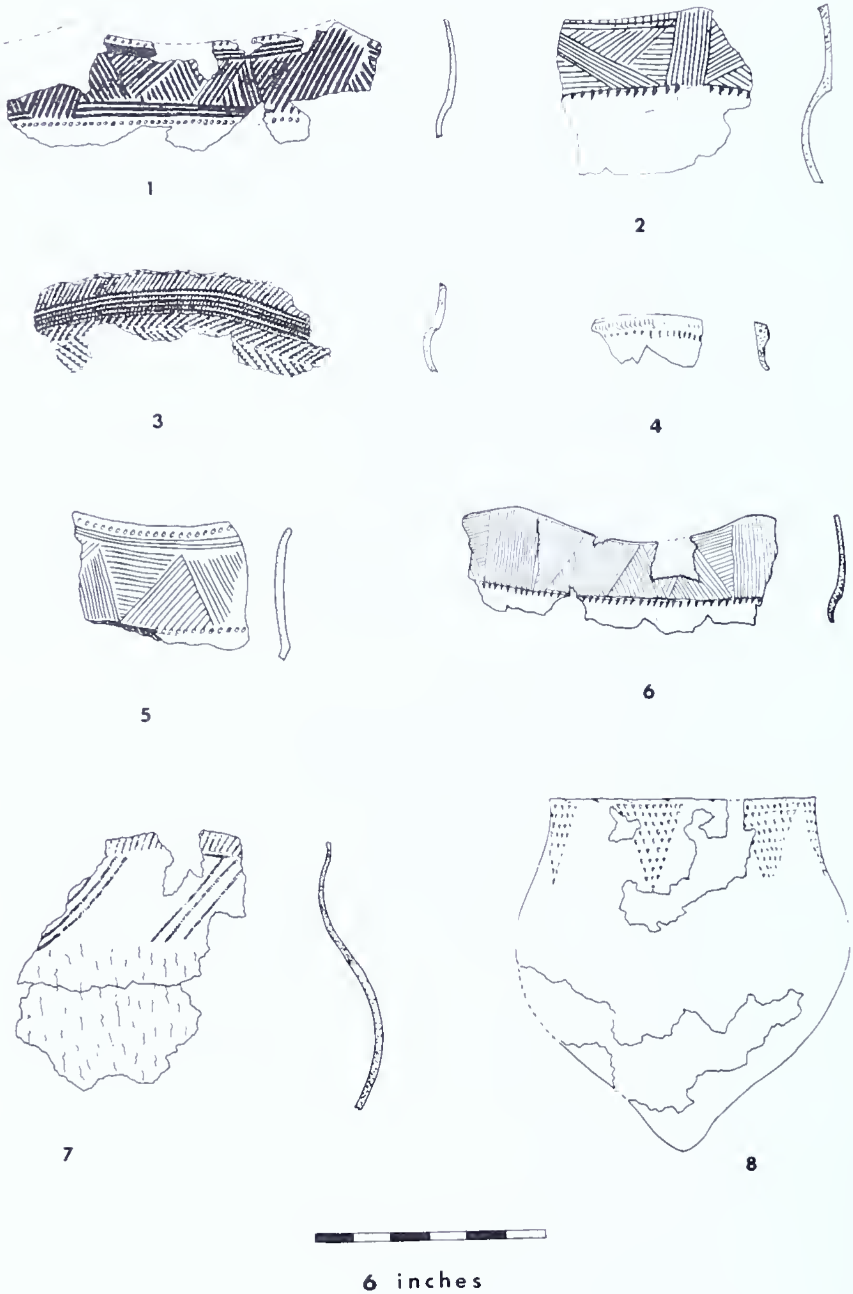

Fig. 32. RIM SHERDS FROM LEVELS 1A AND 1 AT THE ZIMMERMANN SITE: 1, Durfee Underlined (Munsee paste and temper), Level 1; 2, Durfee Underlined, Level 1; 3, Kelso Corded, Level 1; 4, Ontario Oblique, Level 1; 5, Munsee Incised (Otstungo Incised motif), Level 1; 6, Deowongo Incised, Level 1; 7, Lanorie Corded, Level 1; 8, Jack's Reef Corded Punctate (?), Level 1A.

Table 2. Zimmermann Site, Contents of Selected Pits.

Pit No.	Feature No.	Section	Pottery	Illustration	Contents	Organic Remains
96	152	4	Sackett Corded		1 pestle; 3 pitted stones; 1 unpitted hammer; 1 abrading stone; 2 bi-pitted stones	
			Platted Punctate	Fig. 29, No. 2		
			Kelso Corded	Fig. 32, No. 3		
			Lanorie Corded	Fig. 32, No. 7		
			Castle Creek Corded Neck	Fig. 37, No. 14		
			Castle Creek Incised Neck			
91	147	4	Owasco Herringbone	Fig. 35, No. 3	1 Levanna point	
			Castle Creek Incised Neck	Fig. 37, No. 2		
			Necksherd with oblique cord impressions and annular punctates	Fig. 37, No. 9		
			Levanna Cord-on-Cord (?)	Fig. 37, No. 11		
92	148	4	Lanorie Corded	Fig. 37, No. 3	1 incised tablet (Fig. 33, No. 22)	
			Kelso Corded	Fig. 32, No. 3		
			Castle Creek Corded Neck	Fig. 37, No. 14		
130	199	4	Collared punctate, Kelso Corded Motif	Fig. 37, No. 1	1 polished celt, broken; 1 unpitted hammerstone; 1 utilized flake	
			Otstungo Notched	Fig. 38, No. 3		
131	200	4	Garoga Incised	Fig. 38, No. 20	1 pebble netsinker; 1 anvil; 1 large sandstone boulder	2 charred acorns
125	194	3	Bainbridge Linear		6 trimmed sinkers; 2 pebble sinkers; 1 crinoid; 1 faceted abrading stone; 2 unpitted hammerstones; 1 anvil and hammer; flakes (siltstone, black flint, gray chalcedony)	
43	56	2	Munsee Incised (Otstungo motif)	Fig. 32, No. 5	2 pebble sinkers; 1 chisel; 1 elongate pebble hammer	
			Otstungo Notched, undetermined			
52	72	2	Durfee, Wagoner and Garoga Incised		1 triangular point	dog burial in base of pit

Table 2. Continued

Pit No.	Feature No.	Section	Pottery	Illustration	Contents	Organic Remains
65	94	2	Chance (variant)	Fig. 38, No. 10	1 anvil and muller; 1 anvil and hammer; 1 broken pestle; 1 abrading stone	
			Durfee Underlined (linear variety)	Fig. 38, No. 8		
			Durfee Underlined	Fig. 38, No. 13		
149	251	2	Garoga Incised	Fig. 38, Nos. 11, 12	1 pebble netsinker	
			Deowongo Incised	Fig. 35, No. 5		
150	252	2	Bainbridge Linear	Fig. 37, No. 15	1 celt in process; 1 triangular point; small lump of clay; flakes (black flint, tan, gray pebble chert, brown jasper)	2 charred hickory nut shells
			Durfee Underlined (linear variety)	Fig. 38, No. 9		
155	259	2	Otstungo Notched	Fig. 38, No. 7	1 trimmed sinker; 1 pebble pendant, broken; 5 small teshoa flakes; 16 spalls gray pebble flint; 1 flake (red chert)	mollusk shells charred corn
169	276	2	Munsee Incised (stylized face)		1 battered pebble; 2 flakes (white chalcedony)	3 lumps mica particles burned bone
183	291	2	Munsee Incised		1 rolled brass bead; 1 hoe; 1 teshoa; 1 abrading stone; 1 chisel; flakes (brown jasper, gray pebble flint, light gray chalcedony, shale temper with mica)	bone fragments of bear and shad, charred corn, charred hawthorne berry
			Owasco Corded Horizontal			
208	326	2	Munsee Incised	Fig. 38, No. 24	1 teshoa; 1 broken celt; flakes (black flint)	
			Otstungo Notched			
181	289	2	Munsee Incised (stylized face)		1 flake scraper; 1 teshoa; 1 pebble netsinker; 2 pieces cut brass; 1 mortar; 1 large notched pebble; 1 pitted stone; 1 abrading stone; 1 muller; 1 lump of shale temper with mica; flakes (brown jasper, gray pebble, black flint, gray chalcedony)	bone fragments of gray fox, bear, box-turtle

Table 2. Continued

Pit No.	Feature No.	Section	Pottery	Illustration	Contents	Organic Remains
219	344	2	Overpeck Incised Munsee Incised	Fig. 38, No. 6	1 worked arkose pebble; 3 spalls red shale; flakes (argillite, brown jasper, gray chert, black flint)	
222	350	2	Munsee Oblique	Fig. 38, No. 16		charred corncobs
2	2	1	Deowongo Incised	Fig. 32, No. 6	1 trimmed sinker, broken; 1 unpitted hammerstone; 1 pebble sinker	
			Ontario Oblique	Fig. 32, No. 4		
			Durfee Underlined (Munsee paste & temper)	Fig. 32, No. 1		
229	369	2	Munsee Incised Carpenter Brook (Cord-on-Cord) Clemson Island Punctate	Fig. 38, Nos. 15, 21	1 trimmed sinker; 1 pitted stone; 1 broken pestle; 1 end scraper; flakes (brown, red jasper, black flint, white chalcedony, 1 piece shale temper with mica); 3 lumps clay	bone fragments
9	12	1	Durfee Underlined Chance Incised Wagoner Incised	Fig. 29, No. 3	2 fragments of a Meadowood blade; a broken pestle	
214	337	1	Munsee Incised	Fig. 36, No. 1	1 teshoa; 1 abrading stone; flakes (black flint, gray pebble flint, brown jasper)	charred corn
206	324	1	Deowongo Incised	Fig. 35, No. 6	3 pebble netsinkers; 1 trimmed netsinker; 1 unpitted hammerstone; 1 spall scraper; flakes (brown jasper [Fig. 33, No. 18], black flint, red jasper, gray chalcedony)	
			Bainbridge Linear	Fig. 37, No. 17		
			Otstungo Notched (variant)	Fig. 38, No. 1		
			Kelso Corded			
			Chance Incised			
			Collared Punctate (same as from Pit 130)	Fig. 37, No. 1		
230	370	1	Munsee Incised	Fig. 38, Nos. 14, 17-19	1 mortar	
232	372	1	Munsee Incised (stylized face) Chance Incised Kelso Corded	Fig. 38, No. 22	strike-a-light (Fig. 33, No. 16); 2 triangular points; 1 shaft polisher, broken (Fig. 34, No. 16); 1 pipe; 1 large piece shale temper	

this area, a Levanna Cord-on-Cord (Fig. 35, No. 1), and a small vessel with triangular plats of punctates occurring on the rim and neck (Fig. 33, No. 8). The latter vessel is very similar to Jack's Reef Corded Punctate, but some of its attributes vary from the sample from the Jack's Reef site (Ritchie and MacNeish 1949: 107).

The remaining artifacts, netsinkers, scrapers, gravers, and a small clay bead were found in widely separated areas of Section 2, and these could not be associated with any particular feature or artifact.

Artifacts—Level 1

Late Woodland

Of the 419 non-ceramic artifacts from Level 1, 57.4 per cent (240) were found in pits, 32.1 per cent (134) were from the topsoil, and 10.5 per cent (45) are attributed to midden deposits. The ceramic, lithic, and miscellaneous artifacts are listed below. Most of this material is illustrated on Figs. 29 to 39 and listed in Table 2.

Pottery Types	*Rims*	*Percent*	*Estimated Number of Vessels Present*	*Overall Percent*	
Sackett Corded	39	9.38	13	8.38	(Fig. 37, Nos. 6, 7, 10)
Castle Creek Punctate	5	1.20	3	1.94	(Fig. 37, Nos. 4, 18)
Castle Creek Incised Neck	7	1.68	3	1.94	(Fig. 37, Nos. 2, 5)
Castle Creek Corded Neck	28	6.73	1	.65	(Fig. 37, No. 14)
Levanna Cord-on-Cord	4	.96	3	1.94	(Fig. 37, No. 11)
Platted Punctate	6	1.44	1	.65	(Fig. 29, No. 2)
Kelso Corded	46*	11.05	24	15.48	(Figs. 32, No. 3; 37, Nos. 1, 12, 13, 16)
Bainbridge Linear	17	4.09	7	4.52	(Fig. 37, Nos. 15, 17, 19)
Otstungo Notched	7	1.68	7	4.52	(Figs. 37, No. 8; 38, Nos 1, 3, 7)
Lanorie Crossed	5	1.20	1	.65	
Ontario Oblique	3	.72	1	.65	(Fig. 32, No. 4)
Lanorie Corded	4	.96	2	1.30	(Figs 32, No. 7; 37, No. 3)
Chance Incised	33	7.93	17	10.97	(Figs. 35, No. 2; 38, No. 10)
Durfee Underlined	33	7.93	14	9.03	(Figs. 29, No. 3; 32, Nos. 1, 2; 38, Nos. 8, 9, 13)

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*Includes 9 rims, an estimated 7 vessels in stylus punctated technique, Kelso motif.

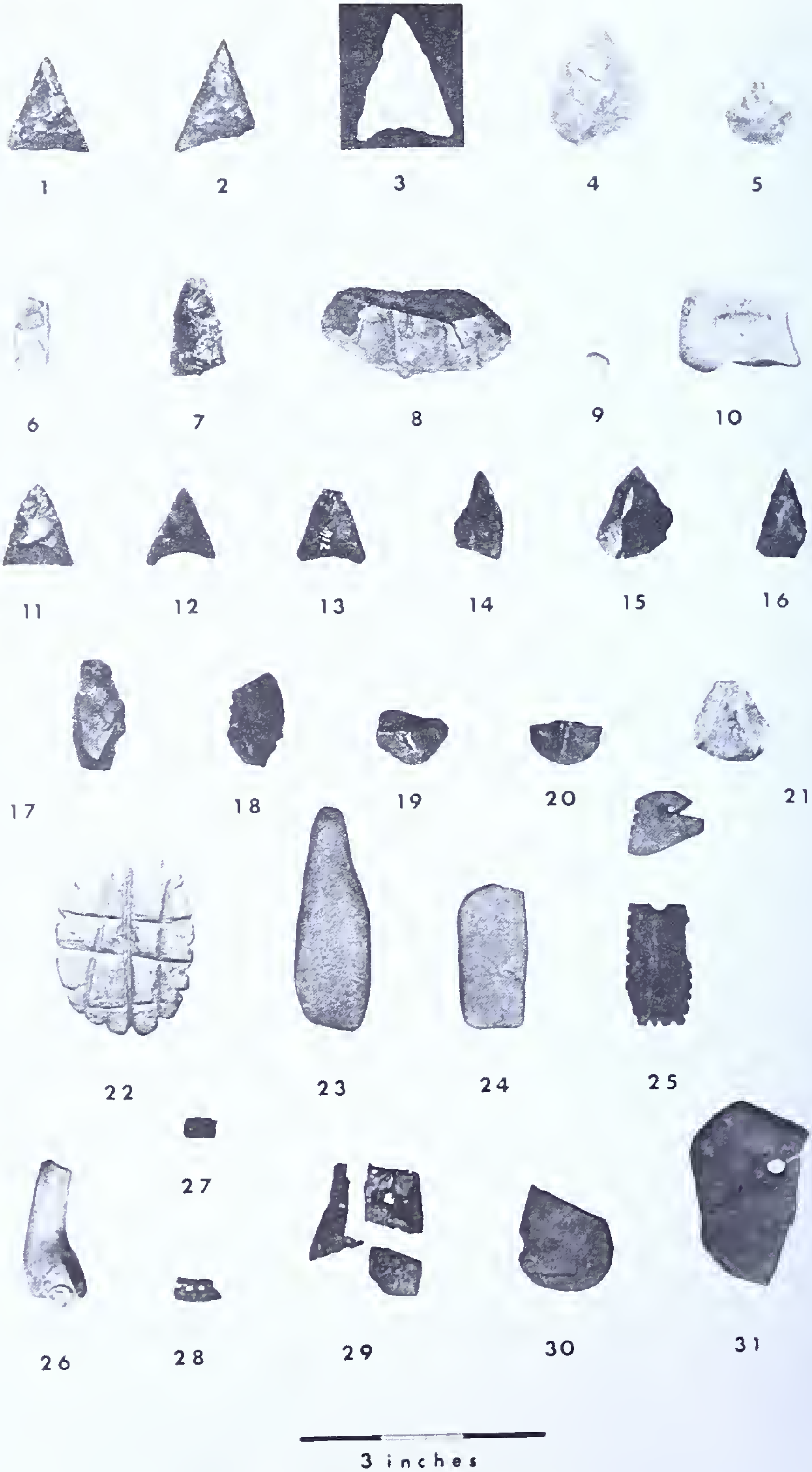
Deowongo Incised	23	5.53	7	4.52	(Figs. 32, No. 6; 35, Nos. 5, 6)
Garoga Incised	31	7.45	8	5.16	(Fig. 38, Nos. 11, 12, 20)
Wagoner Incised	3	.72	2	1.29	
Niagara Collared	1	.24	1	.65	(Fig. 38, No. 5)
Munsee Incised	91	21.88	23	14.84	(Figs. 36, Nos. 1, 2; 38, Nos. 14, 15, 17, 19, 21, 22, 24)
Munsee Oblique	1	.24	1	.65	(Fig. 38, No. 16)
Overpeck Incised	7	1.68	2	1.29	(Fig. 38, No. 6)
Unclassified	22	5.29	14	9.03	(Fig. 38, Nos. 4, 23, 25)
	416		155		

TEMPER

Body Sherds	*White Quartz*	*Fine-to-medium Grit with Biotite*	*Very Fine Grit with Mica*	*Leached (porous)*	*Black Chert*	*Shale*	*Total*
Fine Corded	197	302		107		21	627
Smoothed-over-Cord	35	151			1		187
Smooth	39	625	373	8			1045
Check-Stamped		6					6
Cord-Impressed		1					1
	271	1085	373	115	1	21	1866

Chipped Stone

Generalized Triangular Points		42	(Fig. 33, Nos. 11-13)
Knives		10	
Ovate	6		
Flake	4		(Fig. 33, Nos. 17, 18)
Scrapers		15	
Flake	6		
Spall	4		
Ovate, End	4		(Fig. 33, Nos. 19-21)
Ovate, Side	1		
Drills, Irregular Spall		2	(Fig. 33, No. 14)
Gravers, Irregular Spall		2	(Fig. 33, No. 15)
Utilized Flakes		5	
Strike-a-light, Triangular		1	(Fig. 33, No. 16)
Netsinkers		120	
Notched Pebbles	69		(Fig. 34, No. 10)
Trimmed Edges, Thin	45		(Fig. 34, No. 9)
Round, Oval, Pecked Notches	6		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Hoes		11	(Fig. 34, Nos. 3, 5)
Notched Disc, Large		1	
Notched Pebbles, Large		9	
Teshoa		18	(Fig. 34, No. 6)
Disc-form, Large, Thick		1	
Ground and Polished Stone			
Celts		17	
Finished	8		(Fig. 34, No. 1)
In Process	9		
Chisels, Worked Pebble		7	(Fig. 33, Nos. 23, 24)
Phalloid Object		1	(Fig. 34, No. 2)
Pendants		3	
Sandstone Pebble, Perforated	1		(Fig. 33, No. 31)
Rectanguloid, Incised and Notched	2		(Fig. 33, No. 25)
Knives		3	
Ground, Siltstone	1		(Fig. 34, No. 8)
Ground, Argillite	2		
Pestles, Cylindrical, in Process, and Fragments		11	(Fig. 34, No. 15)
Altered by Usage			
Hammerstones		45	
Plain	20		
Bipitted	15		(Fig. 34, No. 4)
Single-Pitted	10		
Mullers		6	
Combination Tools		16	
Muller/Hammer	8		(Fig. 34, No. 7)
Abrading/Hammer	1		
Anvil/Hammer	5		
Anvil/Sinewstone	1		
Anvil/Abrading	1		
Multipitted Tool		1	
Anvils		18	
Mortars or Milling Stones		6	(Fig. 34, No. 14)
Shaft Polisher		1	(Fig. 34, No. 16)
Whetstones		2	
Abrading Stones		26	(Fig. 34, No. 13)
Cupped Stones		2	

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Fig. 33. ARTIFACTS FROM LEVELS 1A AND 1 AT THE ZIMMERMANN SITE: 1, Levanna point, dark gray chalcedony; 2, Levanna point, dark gray chert; 3, Levanna point, light gray chalcedony; 4, 5, gravers, light gray chalcedony; 6, flake scraper, light gray chalcedony; 7, triangular knife, dark gray chalcedony; 8, keeled side scraper, brown jasper; 9, clay bead; 10, abrading stone, sandstone; 11, generalized triangular point, brown jasper; 12, generalized triangular point, dark gray chalcedony; 13, generalized triangular point, black flint; 14, drill, brown jasper; 15, graver, black and tan chert; 16, strike-a-light, black flint; 17, 18, flake knives, brown jasper; 19-21, end scrapers, brown jasper; 22, incised tablet, shale; 23, 24, narrow chisels, sandstone; 25, incised pendant fragment, siltstone; 26, kaolin pipe bowl fragment, "R. Tippet" mark; 27, brass bead; 28, perforated brass pin fragment; 29, cut brass fragments; 30, incised pebble, sandstone; 31, fragmentary pendant, sandstone.

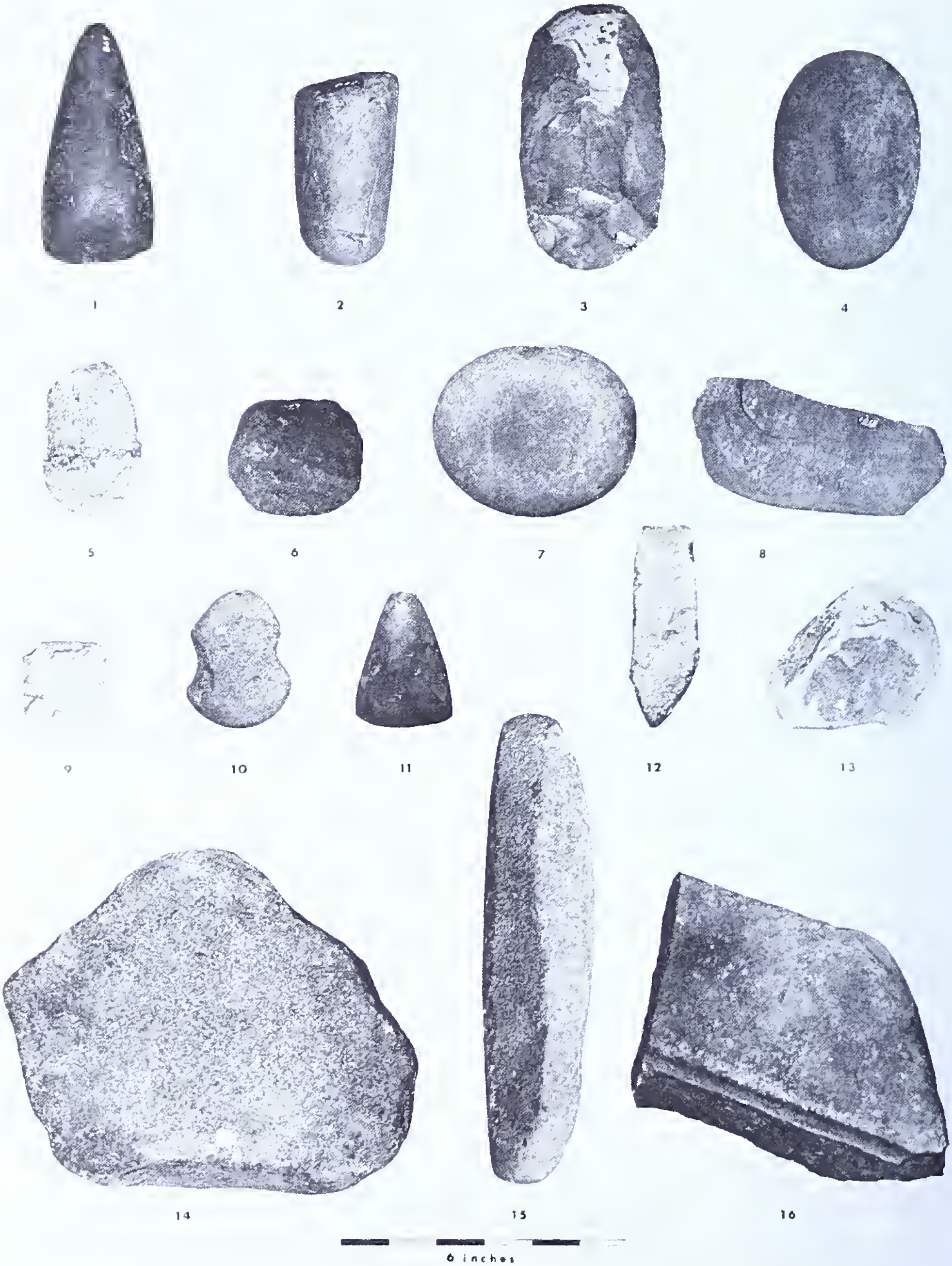

Fig. 34. ARTIFACTS FROM LEVELS 1A AND 1 AT THE ZIMMERMANN SITE: 1, triangular celt, siltstone; 2, phalloid object, siltstone; 3, chipped hoe, siltstone; 4, bipitted stone, sandstone; 5, chipped hoe, quartzite; 6, teshoa, quartzite; 7, grinding stone or muller, sandstone; 8, ground edge knife, siltstone; 9, trimmed netsinker, sandstone; 10, notched pebble netsinker, sandstone; 11, small, trianguloid celt, siltstone; 12, knife, argillite; 13, abrading stone, quartzite; 14, shallow mortar, sandstone; 15, cylindrical pestle, sandstone; 16, shaft polisher, fragment, sandstone; 1-10, 13-16, Level 1; 11-12, Level 1A.

Tabular Stone, Cut	1	
Incised Pebble Tablets	2	(Fig. 33, Nos. 22, 30)
Burnishing Stone	1	
Bone and Antler		
Awl (?) Splinter	2	
Antler, Unmodified	1	
Miscellaneous—Historic		
Kaolin Pipe, "R. Tippet," Obtuse, Bowl and Elbow Fragments	2	
Brooch, Brass	1	
Bead, Brass	1	
Cut Brass Fragments	5	
Large Copper Cent 1849	1	
Indian Head Cent 1897	1	
Natural Materials		
Fossil Concretion	1	
Mica Schist Fragments	3	

CHIPPED STONE

Projectile points total 42, all of which are classified as Generalized Triangular (Fig. 33, Nos. 11-13). Lithic materials are: Helderberg flint (22), gray chert (4), argillaceous shale (2), light gray chalcedony (7), dark gray chalcedony (4), brown jasper (1), and dark gray volcanic stone (2). Twenty-four of these points were found in the topsoil, 16 in pits, one near Hearth 72 (Feature 256), and one in Midden A of the sidehill dump. Two specimens of black flint are asymmetric and may have been employed as knives (Ritchie 1949: 173; Pl. 7, No. 42).

The notched and trimmed sinker implement is common, although the pebble-type sinker is in the majority. This contrasts with the findings at the Bell-Philhower site where the trimmed form was most common (Ritchie 1949: 237). Thirty specimens were found in pits, 11 in the topsoil, and 4 in midden areas.

The remaining chipped-stone tool types, knives, scrapers, drills, gravers, and strikers, are limited in quantity and, with the exception of the argillite ovate knives, most of these tools were made from thick flakes or spalls with a minimum of edge work.

POLISHED STONE

Six of the eight celts are of siltstone while two are made from a gray quartzite. All are oval in cross section with a tapered or pointed poll (Fig. 34, No. 1). One narrow siltsone specimen has flattened sides and is double-bitted. Chisels were usually made by grinding an edge on a thin, narrow sandstone pebble (Fig. 33, Nos. 23, 24). A single phalloid artifact (Fig. 34, No. 2) was formed by the process of incising and grinding. Intentionally shaped and polished pendants are represented by only three fragments (Fig. 33, No. 25). Two fragments are split from one side only, and it is impossible to determine whether these represent a single specimen or two different specimens. Both have perforations at one end. Edges are notched by grinding, and one piece is incised with opposed oblique lines and filled with horizontally incised lines. A third fragment is perforated at the center. Other specimens include a fragmentary sandstone pebble with a single perforation (Fig. 33, No. 31).

ALTERED BY USAGE

One type of abrading stone is faceted (Fig. 34, No. 13). It is usually a granitic pebble with wear facets worn on various edges as a result of rubbing against a coarse surface. Fifteen of these specimens were found, including eight in one pit. A second type resembles a muller, but it is believed that this type might have been used to crush and grind the roasted rock used to temper pottery. An ovate sandstone pebble grinder is identified by coarse abrasions on the edges and center of the stone and a flattening of one or more surfaces as a result of grinding (Fig. 34, No. 7). Mullers differ from the latter form and their evenly worn edges and over-all polished surfaces result from grinding plant material.

Two incised pebbles of unusual character were found in pits (Fig. 33, Nos. 22, 30). The former, from Feature 148, is a soft sedimentary stone, oval in shape, with deeply cut notches around the edge. Broad and deeply incised lines form a tessellated or checkered pattern on the slightly rounded surface while the reverse side is flat and undecorated. In cross section the deeply cut notches and lines are V-shaped. The second specimen, from Feature 271, is a small, thin sandstone pebble that is partially exfoliated. It is decorated with fine parallel incised lines, with others opposed and in juxtaposition. The edge is finely notched.

BONE

Two fragmentary bone splinter awls were recovered from shell middens within pits.

CERAMICS

Sherds and pipes comprise the ceramic industry of Level 1 and these are described herein.

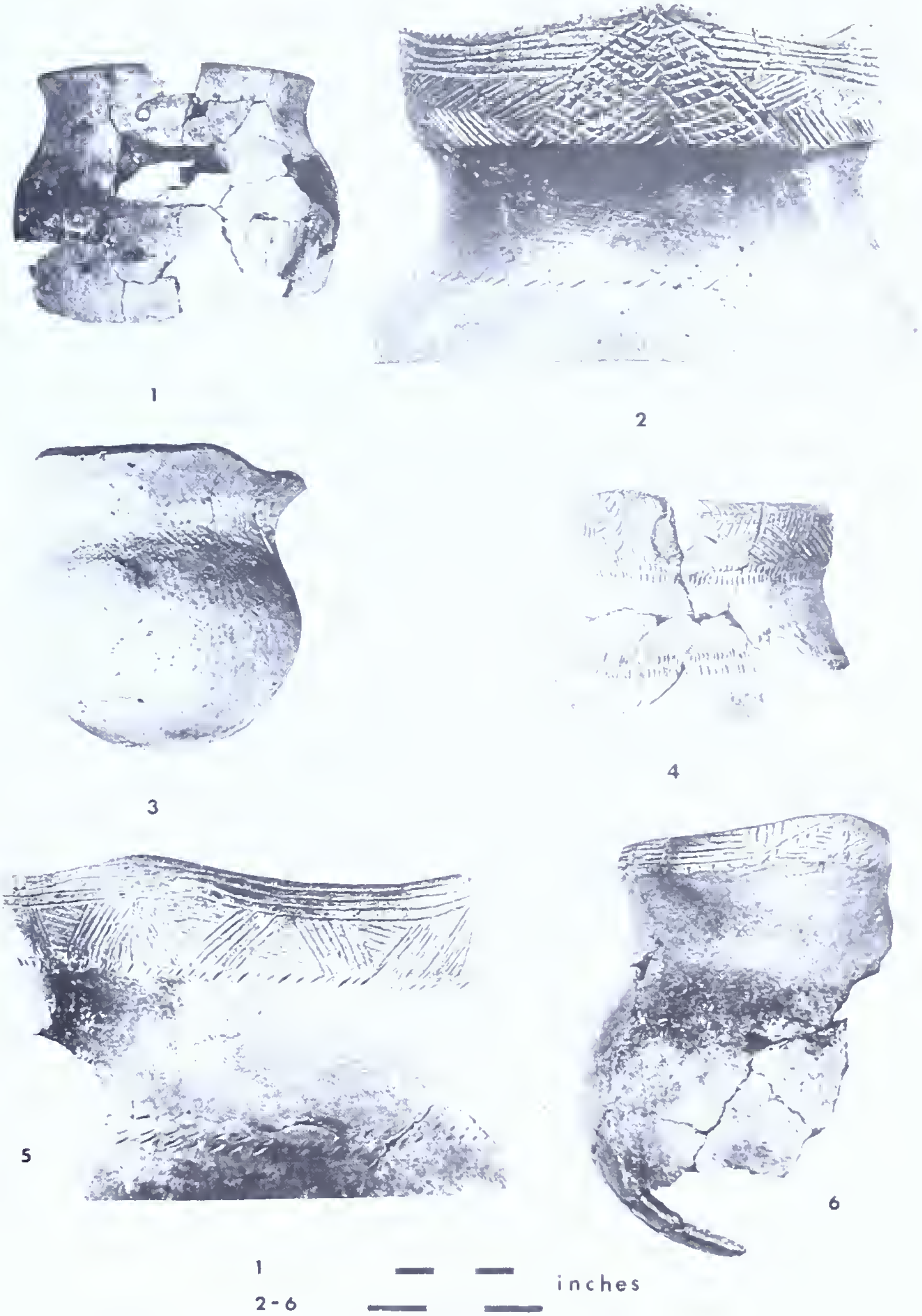

Fig. 35. RIM SHERDS AND A RESTORED VESSEL from Levels 1A and 1 at the Zimmermann site: 1, Levanna Cord-on-Cord, Level 1A; 2, Chance Incised (elaborated motif), Level 1; 3, Owasco Herringbone, Level 1; 4, Otstungo Incised (variant), Level 1; 5, 6, Deowongo Incised, Level 1.

Vessels and sherds representing the majority of the types are illustrated in Figures 29, 32, 35-39. The total inventory includes 416 rim sherds and 1,866 body sherds (page 103). Of this total, 90 rim and 217 body sherds were found in the various middens of the sidehill dump and near the remains of four small hearths. The upper level of the sidehill midden (A) contained the following rim sherds: 1 Durfee Underlined, 34 Munsee Incised, and 11 Garoga Incised. The lower midden (B) contained, in addition to a few sherds of Clemson Island

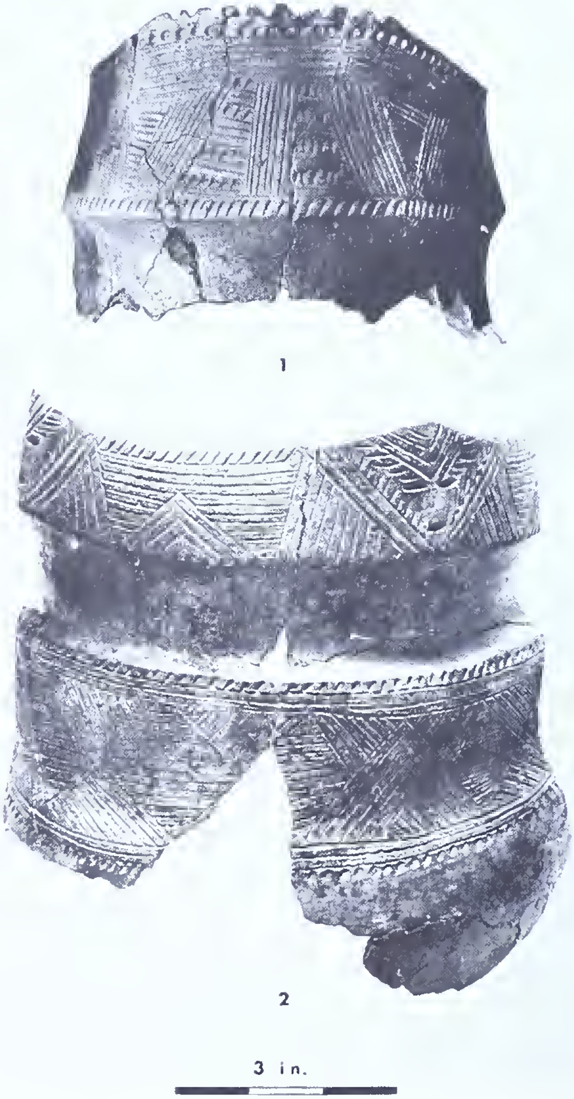

Fig. 36. MUNSEE INCISED RIM SHERDS from the Zimmermann (1) and Davenport (2) sites. Note Susquehannock Schultz Incised influence on (1). Some later Susquehannock influence may also be seen in (2).

and Carpenter Brook Cord-on-Cord, the following rims: one Otstungo Notched, two Castle Creek Punctate, one Bainbridge Linear, and three Durfee Underlined. The latter has a collar 1.25 inches high and it appears to be an earlier form than the type illustrated in Figure 31, No. 3.

In addition to the sidehill middens in Section 1, similar middens occurred beyond the grid in the area adjoining Section 2. Tests of this area by chapter members, Assmus and DeGraw, in 1968 and 1969 revealed midden deposits varying in size from two to five feet. Two middens tested revealed a refuse deposit of some 14 inches, with Owasco Corded Horizontal (Sackett Corded) and spalls found at the base in Level 1A. This was overlaid by corded collar, linear, and early incised types, while at the top there was Munsee Incised and flakes of jasper and pebble flint.

One interesting variant of Chance Incised was found in one of the several midden areas (refer to Appendix, pages 469-70, for a description). Fine incised lines on the collar of this vessel are similar to those on the necks of Bainbridge Collared Incised and Bainbridge Linear. The motif of triangular plats filled with opposing incised lines in combination with interrupted paddle-edge impressions suggests hesitant attempts to apply the incised technique to the collar of a vessel. This simple pattern of carelessly applied lines, some of which overlap those of opposing elements, resembles the pattern stones from the Bell-Philhower site (Ritchie 1949: Pl. 9, No. 10). The color, grit, and paste characteristics are also typical of the late Bainbridge types.

The remaining sherds were from the many pits. Significant associations of pottery types and/or artifacts are listed in Table 2. This table reveals a horizontal pattern indicated by pottery types from pits from the various sections. Late Owasco types of the Castle Creek phase are restricted to the western portion of the site (Section 4). The addition of later types (Bainbridge Linear and Bainbridge Notched Lip) occurs in Sections 3 and 4, while the addition of Bainbridge Collared Incised and early incised types (Chance and Deowongo) next appears in the extreme northeast portion of the site. The development of the incised theme continues to occupy the eastern half of the site, with Chance, Durfee, Garoga, and Otstungo types predominant in pits. The final phase is represented by Munsee Incised which also is predominant in the eastern half of the site.

In addition to the diagnostic pottery types described or referred to, several variants or trade sherds are present. These include: Lanorie

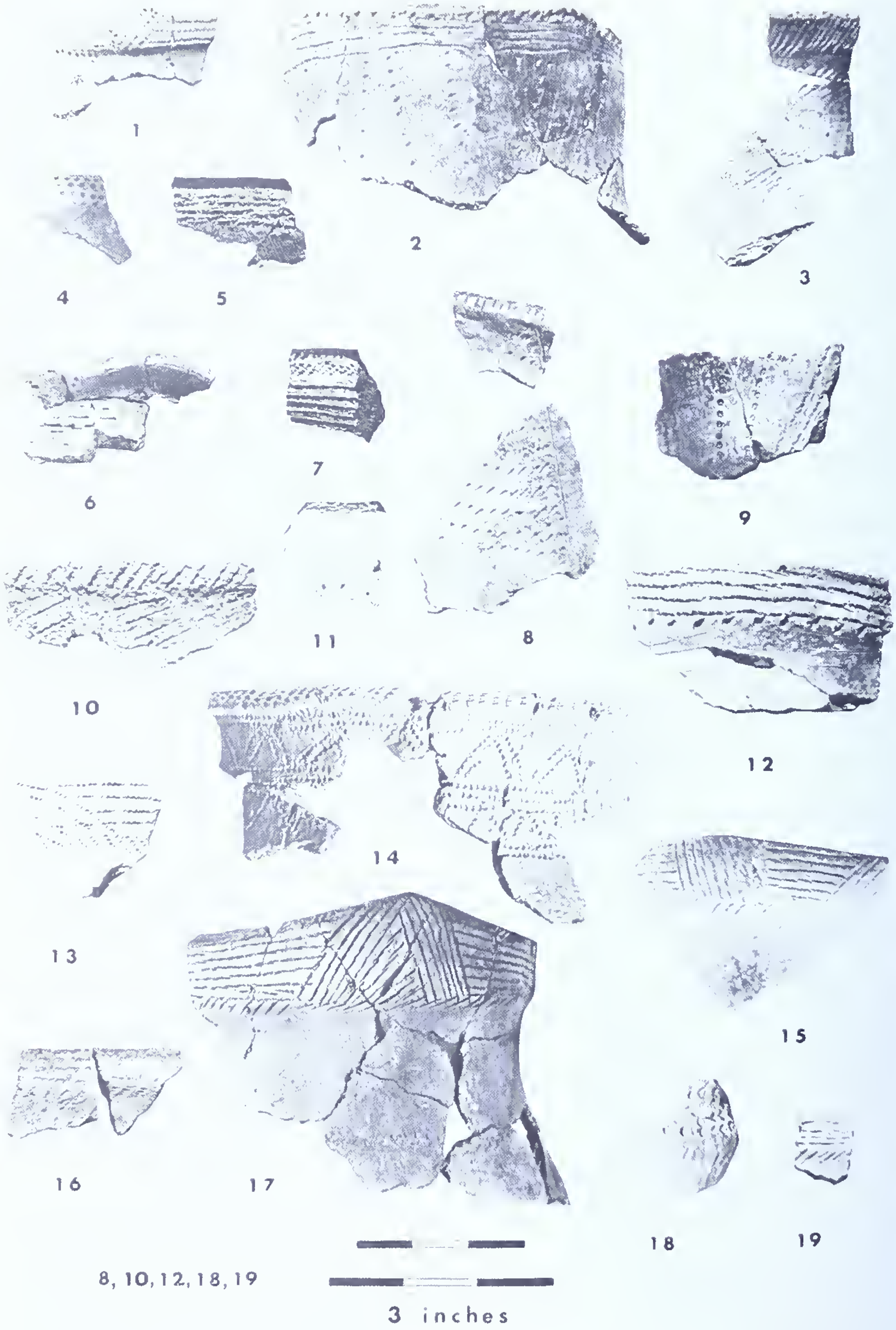

Fig. 37. RIM SHERDS FROM THE ZIMMERMANN SITE: 1, Kelso Corded (punctate variety); 2, 5, Castle Creek Incised Neck; 3, Lanorie Corded (note herringbone pattern on neck and shoulder); 4, Castle Creek Punctate; 6, Owasco Platted; 7, Owasco Corded Horizontal; 8, Otstungo Notched (note open triangles filled with linear punctates); 9, neck sherd with oblique cord impressions and circular punctates; 10, Owasco Corded Oblique; 11, Levanna Cord-on-Cord (?); 12, 13, 16, Kelso Corded; 14, Castle Creek Corded Neck; 15, 17, 19, Bainbridge Linear; 18, Castle Creek Punctate (toy vessel).

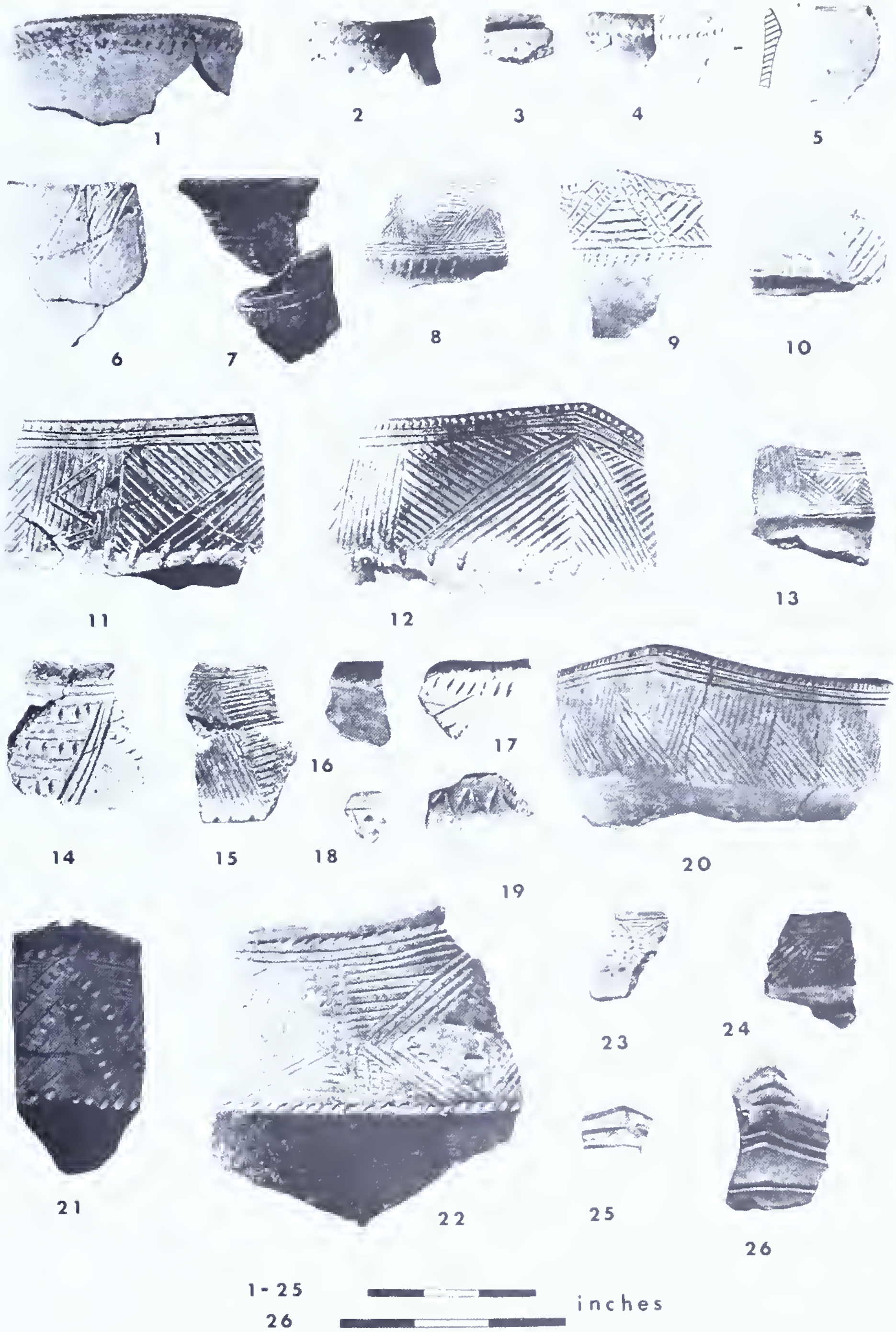

Fig. 38. RIM SHERDS FROM THE ZIMMERMANN SITE (Davenport site No. 26 only): 1, Otstungo Notched (variant); 2, Kelso Corded; 3, Otstungo Notched; 4, 23, untyped; 5, Niagara Collared; 6, Overpeck Incised; 7, Otstungo Notched; 8, 9, Durfee Underlined (linear variety); 10, Chance Incised; 11, 12, 20, Garoga Incised; 13, Durfee Underlined; 14, 15, 17-19, 21, 22, 24, Munsee Incised; 16, Munsee Oblique; 25, untyped (note the similarity of incising between nos. 25 and 26); 26, exterior of head-in-round, Pit 8 (Davenport site).

Crossed, Niagara Collared (Fig. 38, No. 5), both early Ontario Iroquois types (Lenig 1965: 70), Overpeck Incised (Fig. 38, No. 6) and possibly a later form with a herringbone pattern, Zimmermann Platted Punctate (tentative, Fig. 29, No. 2), and Ontario Oblique (Fig. 32, No. 4). Ontario Oblique, also an early Ontario Iroquois type, has a long history and a wide range of motifs and techniques (Wright 1966: 26, 111-3, 137, 146).

Variations on published type descriptions are as follows: Castle Creek Corded Neck (Fig. 37, No. 14); Otstungo Notched Lip (Figs. 37, No. 8; 38, Nos. 1, 3, 7); Kelso Corded (Fig. 37, No. 1); Owasco Platted (Fig 37, No. 6); Chance Incised (Fig. 35, No. 2); unillustrated are a few sherds of this type decorated with a combination of incised and cord-impressed elements; Otstungo Incised (Fig. 35, No. 4); and Garoga Incised (Fig. 38, No. 11).

Pipes are rare. With the exception of four round-stem fragments, all examples are illustrated in Figure 39 and they are described below:

No.	*Form*	*Decorative Technique*
1	unknown	cord-impressed
2	obtuse angle	incised
3	unknown	*pointillé*
4	plain trumpet	linear incisions on lip
5	ring bowl	punctate
6	broad stem	perforated
7	obtuse angle	punctate
8	unknown	*pointillé* and incising
9	obtuse angle	linear
10	unknown	*pointillé* and incising

Pipes numbered 4 and 5 were from the same pit and the latter may be a fragment of the ring bowl type of the Chance phase (Lenig 1965: 17). Pipes numbered 8 and 10 are thin, well-made specimens with patterns typical of those found at the Abbott Farm (Cross 1956: Fig. 5, No. 3; Pl. 32a, Nos. 6, 7) and the Overpeck sites.

VERTEBRATE REMAINS

Vertebrate remains were not abundant. A summary of Guilday's analysis is provided.

Feature	*Animal*
Hearth 74, Feature 260	Approximately 45 fragments, one identified as deer
Pit 129, Feature 198	Gray squirrel, deer, sucker
Pit 138, Feature 224	Deer, skunk, turkey
Pit 159, Feature 264	Beaver, Shad, unidentified mammal
Pit 181, Feature 289	Gray fox, bear (worked tooth), box turtle carapace, unidentified mammal
Pit 183, Feature 291	Shad

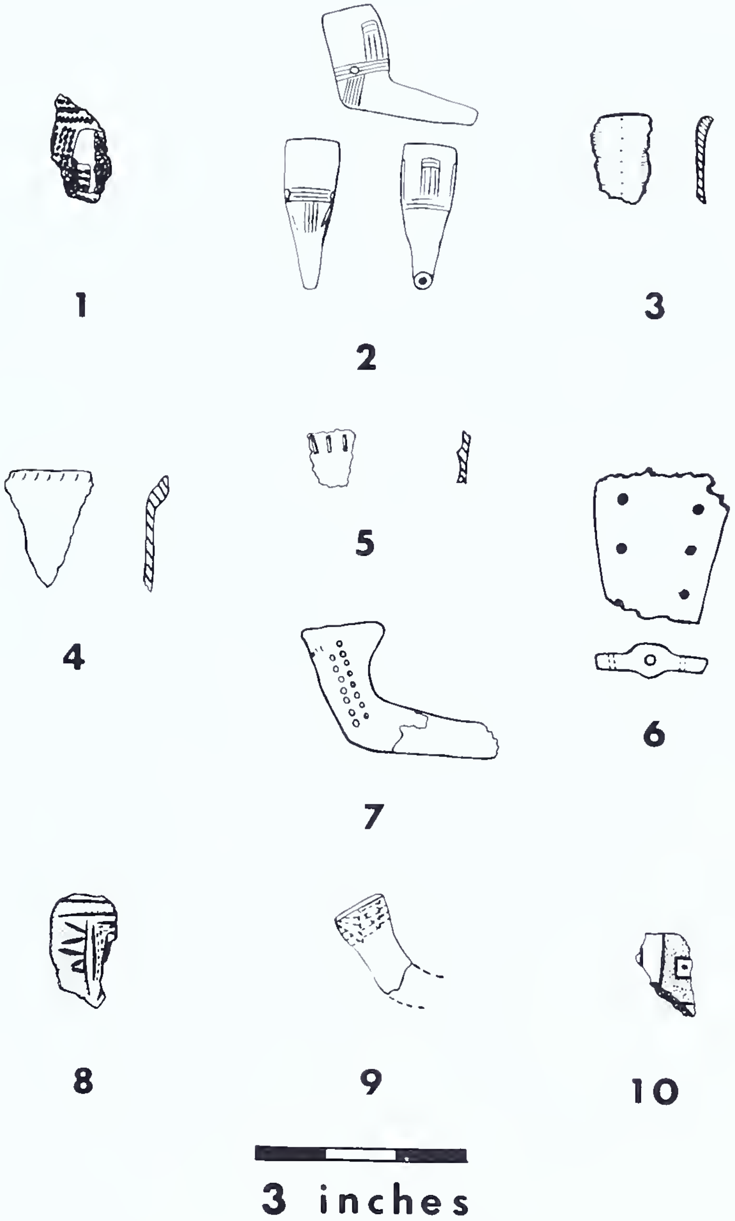

Fig. 39. CLAY PIPES AND FRAGMENTS FROM THE ZIMMERMANN SITE: 1, bowl fragment with corded decorations; 2, incised plats with circular punctates; 3, *pointillé* plats; 4, bowl fragment of trumpet type; 5, bowl fragment with rectangular punctates; 6, stem fragment with perforations along both edges; 7, elbow pipe with slightly flared lip and circular punctate decoration; 8, 10, bowl fragments with *pointillé* and incised decoration; 9, elbow pipe with triangular design in linear punctation.

INTERPRETATIONS AND CONCLUSIONS

DELAWARE VALLEY ARCHAIC COMPLEX AND SUSQUEHANNA PHASE COMPONENTS

The complete excavation of the Zimmermann site provides a comprehensive picture of several phases of prehistoric culture and their relationship with other manifestations in the Upper Delaware Valley and elsewhere in the Northeast.

The earliest component, Level 4, is assigned to the Delaware Valley Archaic complex on the basis of diagnostic Lackawaxen Stemmed points. A radiocarbon date of 1710 B.C. ± 120 years for a similar component at the Brodhead-Heller site may be the approximate date for this manifestation at the Zimmermann site. The extensive assemblage of the Susquehanna phase is closely associated with the Delaware Valley Archaic complex. Unfortunately it is not possible to separate what are probably two distinct components. This is not surprising since the Brodhead-Heller date is considered terminal for that complex, and the Susquehanna phase at Zimmermann is 1650 B.C. ± 80 years. It seems unlikely that these two different cultures were living simultaneously at this site. An interpretation that little time elapsed between the two occupations is favored. Perhaps the two components are separated by no more than a span of 50 years, during which there was no appreciable accumulation of soil to cover the features and materials left behind. Another possibility is that the Susquehanna people forced the early occupants off the site.

The date for the Susquehanna component suggests that previous estimates for this culture by Witthoft (McCann 1962: 55), and Ritchie (1965a: 156) were too modest. An earlier date of about 1800 B.C. to 1700 B.C. would be more in line with the actual emergence of this phase and its suggested development from a Savannah River-like phase in the lower Susquehanna Valley. Savannah River-like points such as corner-removed from the Long site (Witthoft 1959b: 82, Fig. 1 g-k) may have been incipient to the development of related cultures such as Lehigh, Koens-Crispin, and Snook Kill. The Watertown phase in New England, with Wayland Notched/Susquehanna Broad points, has been radiocarbon dated to 1520 B.C. and 1670 B.C. (Dincauze 1968: 76).

The lack of soapstone vessels and the high percentage of points made of rhyolite in Level 4 would seem to indicate a small but mobile group of people with canoe transport. The features, consisting of 19 hearths, and the points and tools tell us little about the pattern of living, except for the evidence of hunting as the primary activity. Three hearths contained small fragments of calcined bone, and the remainder were sterile or contained only charcoal. The workshop and the related caches of chopper-like tools indicate a preference for siltstone for specific tools. Several of the rhyolite points were made with a minimum of work from pentagonal-shaped blanks. Broken specimens and small chips from this process were found (Fig. 21, Nos. 12, 13). An apparent depletion of the supply of rhyolite blanks and points is suggested by the substitution of chert and argillite. Specimens made from the former attain a frequency of 33 per cent.

Ovate choppers, manufactured on the site, do not show any form of wear or use. The spade-shaped specimen of sandstone closely resembles the form found by Ritchie (1965a: Pl. 53, No. 6) in the Frost Island phase and shows a small amount of edge-wear.

There is some evidence, mostly in the nature of broad fishtail point forms (Fig. 23, No. 18), for the development of the Dry Brook phase from the Susquehanna phase. This maturation may have had its earlier beginnings outside of the immediate area, perhaps in the middle regions of the Delaware, where the Perkiomen and "serpent-head-shaped" forms may have influenced the progression.

DRY BROOK COMPONENT

The most significant discovery is the numerous features and artifacts in Level 3 that define a cultural manifestation which I have termed the Dry Brook phase of the fishtail tradition. This phase is believed to derive from the late stage of the Susquehanna phase. The discovery has provided the opportunity to study the material remains and to define the way of life for a nomadic group of people at the end of the Archaic period.

The divergence of the Dry Brook people throughout a large area of the Northeast is demonstrated by the occurrence of the Dry Brook fishtail point in central, southern, and eastern New York (Ritchie 1959: 90) and at the Salisbury and Goose Island sites on the lower Delaware (Cross 1941: 56-8, 64; Pl. 16b, Nos. 8, 12). The latter sites also had soapstone bowl fragments and pebbles with pecked notches (Cross 1941: Pl. 20b, Nos. 2, 4). Similar forms appear in New England where they have been referred to as Eared (Fowler 1963: Fig. 1) and Susquehanna Broad (Ritchie 1969b: Pl. 11, No. 9). The projectile point of the Coburn manifestation, a burial site on Cape Cod (Kremp 1961: Fig. 6, Nos. 1-25), resembles closely the Dry Brook form. Coburn is recognized by Dincauze (1968: 88) as the latest recognized culture of the Susquehanna tradition in New England and one of the immediate ancestors of the Orient phase on Long Island. The tapered stemmed point, also found in the burial deposits (Kremp 1961: Fig. 6, Nos. 27-51) in considerable quantity, resembles the refined blank of the Dry Brook phase and, like the Meadowood mortuary blade, may have been included as a burial offering. The grooved axe, gouge (grooved adze), and cylindrical pestle do not occur in the Dry Brook and early phases of the broadspear tradition in Pennsylvania. In New England they occur in various Late Archaic assemblages and their presence in Coburn (Kremp 1961: 39) suggests this group as the donor of these traits to the Orient phase on eastern Long Island. Although Coburn is undated, the excavated data from the burial sites suggest a development parallel in time with the Dry Brook phase. What relationship, if any, there may be between it and the Dry Brook phase is presently unknown.

A single radiocarbon date from charcoal from Hearth 4 (Feature 44) of 1280 B.C. ± 120 years (Y-2343) may approach the earliest occupation of Level 3; however, a series of dates would be necessary to approximate the temporal span of the Dry Brook phase. The hearth from which the sample was taken provided close association of soapstone fragments from vessels with chiseled (Fig. 26, No. 2), smooth, and decorated (incised) (Fig. 27, No. 2) exterior surfaces. Pieces from a vessel with a crudely tooled exterior were also found in nearby areas of Section 3 and these may predate the smooth bowl types.

Approximately 50 per cent of the lithic artifacts are classified as projectile points. This fact would suggest that hunting was the primary subsistence activity.

The Dry Brook fishtail point, the only point type found in Level 3, apparently tipped a hand-held spear or shaft propelled with or without a spearthrower. A grooved object cut from a soapstone bowl fragment may represent a form of tie-on atlatl weight (Fig. 25, No. 2).

Bone debris was restricted to very small calcined fragments. These fragments were present only in or near cooking or baking hearths surrounding the large platform features, and they appeared to be the remains of meals. An analysis of the bone by Guilday indicates the fragments are from a large mammal, possibly deer. Other animals must certainly have been included in the diet, but their remains failed to survive.

Edible foods gathered in season were probably part of the economic pattern; charred acorns and hickory nut shells in two hearths are evidence for this activity. A third hearth contained a large milling stone which probably was used to grind or crush seeds or nuts. Fishing by the use of nets does not appear to have been a common practice. Seven pebbles with shallow-notched edges have been classified as netsinkers. These do not resemble the netsinkers of later peoples and perhaps these specimens were used as weights for lines.

There is no positive evidence within the large platform hearths to indicate their use in cooking, although it is believed that stones were removed from these hearths with wooden sticks for boiling the food in soapstone vessels. The areas around these large features were littered with fire-cracked stones, soapstone vessel fragments, and other artifacts in varying frequency. On occasion the broken stones were picked up and returned to the hearth. Thick concentrations of stones were found on the perimeter of two features.

Fires on large beds of stone provided warmth and afforded some protection against scavengers. If meat or fish was cooked or smoked over these features, there is little evidence for this activity except for a single postmold closely associated with Feature 63, Section 1. In view of the heavy deposits of charcoal and ash within some of the features, it appears that they were used over a period of several seasons. The sand underlying these large features was often stained, but not as deeply as was the case in some of the smaller features (Fig. 16). The depth of the reddish discoloration of burned sand (10 inches in some instances) suggests beds of hot coals used in roasting or baking.

Other than projectile points, the chipped stone industry is limited to a few basic tools used for scraping, drilling, and cutting. Broken projectile points were rarely resharpened although they were not wasted. Usually they were rechipped to form a scraper edge or drill tip. Unmodified specimens were used as flint strikers with some form of sulphide, perhaps marcasite (Witthoft 1966: 46-7). Fire-making sets were found in several instances in association with several hearths. Mineral samples from the Dry Brook component and the Lackawaxen component at the Herring No. 1 site were submitted to Davis M. Lapham, chief mineralogist, Bureau of Topographic and Geologic Survey, Commonwealth of Pennsylvania. Lapham provided the following analysis:

> Both samples, which you submitted for identification, are composed of hematite and limonite. There is no positive evi-

> dence that either one was originally pyrite; however, it is possible that an original pyrite has completely oxidized and hydrated to hematite and limonite.

It is probable that these represent fire-making sets.

Scrapers are not plentiful, which suggests that bone may have played a major role as material for scrapers. Only one specimen reveals any appreciable wear (Fig. 24, No. 3), and this from one side only. Thick spalls with resharpened edges and thinner flakes were used, and wear is quite evident on the thinner flakes where minute scars are evidence of use on hard materials.

Two distinct drill forms may indicate separate functions. The reworked point was used to drill repair holes in soapstone vessels when they developed cracks. One drill actually matched the striations in a perforation. The long, expanded-base drill was probably used in working bone, antler, and wood, and it was probably hafted. Knives of various forms also reveal varying degrees of wear. One projectile point (Fig. 23, No. 7) is heavily worn on one edge suggesting possible use on wood or bone for cutting and grooving. The small, triangular bifaces (Fig. 24, No. 11) do not reveal any wear and their placement in this category is tentative. Flakes were used for cutting and when used on hard materials they reveal edge wear and damage very similar to the flake scrapers.

Few of the heavier polished stone tools have survived the rigors of use. Six of the seven celts are fragmentary and show varying amounts of grinding and polishing. Several of the bit portions reveal damage from blows on hard materials. The use of the single adze (Fig. 25, No. 10) as a woodworking tool seems assured because its surface is encrusted and burnished with charcoal. Two large, bifacially chipped blades have been tentatively described as picks. The finished specimen (Fig. 27, No. 1) could also have served as a knife. Specialized abrading stones (Fig. 25, Nos. 4, 5) may have been used to grind the notches and bases of projectile points and for other grinding tasks, while similar tools were used to grind or polish the edges of celts or adzes.

Little evidence for the apparel of the Dry Brook people was uncovered except for a few items of an ornamental nature. A total of 32 soapstone vessels is estimated and it is likely that more may have been in use. As they broke or fell into disuse the fragments were made into various ornaments, utensils, and possibly other objects. Great care was taken to extend the life of these vessels. Cracks in vessel walls were repaired by drilling holes on opposite sides and lashing to prevent further separation. When a vessel was broken beyond repair the lug was removed, the broken edge smoothed, and the remaining portion continued in use; the smaller sections probably served as ladles or scoops.

The raw material for the vessels is generally fine grained and ranges in color from a greenish-gray to a medium gray. An exception is a vessel made of a medium gray soapstone with tan and pinkish areas (Fig. 26, No. 1). The texture is porous and contains areas of concentrated magnetite. None of the Zimmermann material is comparable to specimens from the Frost Island phase. Bowl fragments from this phase, viewed by the author at the New York State Museum and Science Service, Albany, New York, February, 1966, are dark gray in color and probably came from the Christiana area in Lancaster County, Pennsylvania. Vessels from New England in the Bronson Museum, Attleboro, Massachusetts, reveal differences in material and color. New England specimens generally have thinner walls, smooth surfaces, and are asymmetrical in outline and section. They lack the more sophisticated decorative embellishments and shaping of some of the specimens at Zimmermann.

Burial customs of the Dry Brook people are unknown. Cremation may have been practiced, although evidence is lacking for this or any other form of burial prior to Early Woodland in the Upper Delaware Valley. A cremation on Frontenac Island associated with "killed" Susquehanna broadspears of rhyolite, and a similar burial at the Piffard site with Perkiomen points and red ochre (Ritchie 1965a: 162) attest to religious ceremonialism during the earlier phases of the broadspear tradition. These broadspear manifestations and those of the Orient phase on Long Island (Ritchie 1965a: 173-7), the Meadowood phase (Ritchie 1965a: 195-8), and several New England complexes participated in a northern-oriented mortuary ceremonialism, which appears to have developed in the earlier Old Copper culture of the Midwest and later to have diffused eastward where it is recognized in such complexes as Red Ochre and Glacial Kame.

Radiocarbon dates for the Frost Island phase (Ritchie 1965a: 156) and the Dry Brook phase are almost identical. The artifact inventory of the Frost Island phase, with the exception of Vinette 1 pottery and a few broad fishtail points, would be at home in the Susquehanna component in Level 4. If the dates for Zimmermann are correct, as seems likely, then some of the broadspear (Susquehanna) forms and other artifacts including choppers; thin, notched netsinkers; and chipped and ground adzes of the Frost Island phase should date approximately 1500 B.C. to 1400 B.C. A date of 1520 B.C. ± 125 years for the Watertown phase, a Susquehanna Broad/Wayland Notched complex in the Sudbury River valley of Massachusetts, with chipped and ground adzes and soapstone bowls (Dincauze 1968: 44-9, 76) adds strength to this contention.

The Dry Brook phase, with its soapstone bowl industry, of the fishtail tradition flourished from 1300 B.C. to 1100 B.C. in the Upper Delaware Valley. It represents what has been termed the fully developed "Transitional" stage of culture (Witthoft 1953; Ritchie 1965a: 149), or, as defined here, the latter part of the Late Archaic period.

Lacking firm data on housing and food remains, an estimate of group size at between 40 and 75 is based on the arrangement of features, tools, midden debris, and the available food sources within a reasonable hunting radius of 30 miles of the river valley. "The nature of a hunting economy does not ordinarily permit the aggregation of large numbers of people in one place at one time" (Laughlin 1968: 315). The site was probably occupied periodically during periods when weather and game were most favorable. During the cold winter months the group may have taken up residence at the quarry sites to replenish their needs. Possibly they remained in the more favorable climate of the lower Delaware Valley or the Chesapeake Bay area until spring.

EARLY AND MIDDLE WOODLAND

Following the heavy flooding of Level 3 there appears to be a gap in the sequence. Levels 2A and 2B are the Early and Middle Woodland occupation with intermittent use of the site extending over a period of more than 1,000 years. The delineation and chronology for these several components are based upon typology and radiocarbon dates obtained elsewhere. Some stratigraphy and horizontal associations are noted.

ORIENT COMPONENT

The large platform hearth is present and Orient fishtail points of chert and jasper are apparently associated with Vinette 1. One hearth in Section 2 provided an association of this diagnostic point type with Vinette 1 pottery, refined triangular blanks or knives, hammerstones, and a sinewstone. The gap in the occupation at Zimmermann appears to be filled by the Orient occupation at numerous other local sites with similar components such as Brodhead-Heller, Miller Field, Faucett, Herring No. 2, and others. At the Herring No. 2 site (Werner 1968) an Orient component includes: Orient projectile points, steatite bowls (gritty texture and smooth surfaces), drills, celts, quarry blanks, strike-a-lights, hammerstones, a gorget, and a large platform hearth. The limited Orient occupation is estimated to date from 1100 B.C. to 800 B.C. at the Zimmermann site.

Meadowood Component

Meadowood peoples are believed to have occupied the site briefly between 800 B.C. and 700 B.C.; charred walnut shells in one hearth suggest a late fall occupation. This component includes Meadowood projectile points, a hammerstone, multipitted and bipitted stones, a whetstone, triangular end scrapers, and three basin-shaped hearths. Due to the mixture of pottery types it is impossible to determine what pottery is associated with this component. It seems possible that a local variety of Exterior Corded/Interior Smoothed (redware) may be associated.

Bushkill Component

The presence of the newly postulated Bushkill complex (refer to pages 364-9) is suggested by a meager assemblage. The only clear vertical separation of components in Level 2 occurred in Section 2 where two hearths (Features 288 and 357) were found above Orient materials. Two Lagoon points and Dentate Stamped sherds with fine to medium quartz temper were associated with these features. A concentration of flint chips around Hearth 101 (Feature 288) suggests flint chipping in the area. Three other Lagoon points were found in Sections 1, 3, and 4 at depths of 17, 19, and 14 inches respectively or slightly above the Orient and Meadowood components. A few cracked stones and chips were scattered at this depth in Section 4, but pottery and features were absent. Other tools found at similar depths in Zone 3, which may be part of this component, include an argillite Rossville point, a narrow triangular knife of gray chert, a broad triangular argillite knife, and two pitted stones.

Small broad-stemmed points (Fig. 30, Nos. 4-8, 13) are a new type in the area for the Early to Middle Woodland period and they have been confused with the Bare Island type (Leslie 1963c: 74-5) and Lackawaxen Stemmed (Leslie 1967a: 111-2), both of which are Late Archaic types. The broad-stemmed points may be within the range of the Wading River point of the Lagoon complex (Ritchie 1969b:

75). A group of eight of these points was found close to Hearth 71 (Feature 250), which contained several sherds of Vinette 1. Other artifacts include an Exterior Corded/Interior Smoothed vessel with a conoidal base and the temper leached, an expanded-base drill of argillite, and sherds of wiped and modified interior cord-marked pottery. This assemblage may be part of the Bushkill component, and it resembles similar materials from the Faucett site. The suggested range for the Bushkill occupation is based upon dates for the Lagoon complex on Martha's Vineyard which range from 520 B.C. to 100 B.C. (Ritchie 1969b: 161, 224) and the Upper Delaware Valley dates ranging from 480 B.C. to 100 B.C.

KIPP ISLAND COMPONENT

Diagnostic Kipp Island artifacts (Figs. 30, 31) include Jack's Reef Corner-Notched and Pentagonal points, prismatic flake knives, flake end scrapers, thin triangular knives, a "T"-shaped drill, blanks, an abrading stone, grooved and notched pebble sinkers, and a banded slate pendant.

A ground slate knife, thick side-notched points, a beaver incisor, a plano-convex adze, and a chopper are Kipp Island artifacts that may belong to the earlier phase of Point Peninsula. A large restored Point Peninsula Corded vessel is characteristic of middle to late Point Peninsula. The probable date of this component lies between A.D. 310 and A.D. 630 (Ritchie 1965a: 228).

OTHER—UNIDENTIFIED

There are a few untyped and non-diagnostic projectile points for Levels 2A and 2B. It is unknown whether they are traits of previously described components or if they are traces of a minor and unknown component (s).

Narrow Stemmed	1 (Fig. 30, No. 11, 12)
Corner-Notched	2 (Fig. 30, No. 1, 2)
Side-Notched	1 (Fig. 30, No. 3)

LATE WOODLAND

EARLY OWASCO

Judging from the paucity of artifacts found in an area 100 feet by 50 feet in Level 1A, the material is restricted in content and time. This area was devoid of animal and vegetal remains as well as evidence for house structures. The most significant feature was a large ash bed at the extreme western edge of the site. Several sherds of Clemson Island and Jack's Reef Corded were found in the ashes, and their appearance was unchanged in comparison with sherds found outside the feature. Levanna points, netsinkers, knives, and scrapers were associated with this ash bed. A few sherds of Owasco Corded Oblique and Owasco Corded Horizontal were found near the perimeter with several fire-cracked rocks.

Except for the Clemson Island and Jack's Reef Corded Punctate, most of the items from Level 1A correspond to the Carpenter Brook phase in New York currently dated about A.D. 1100. The previously mentioned pottery types may be transitional to early Owasco and may have preceded the Carpenter Brook component at the site.

LATE OWASCO TO MUNSEE COMPONENT

The terminal Woodland occupation in the area, which is represented at the Zimmermann site, has been the subject of considerable investigation, publication, and occasional controversy over the past 50 years. This paper does not resolve the issue although it contributes to a better understanding of this period.

Traits at the Zimmermann site compare with those of the Bell-Philhower site, and they reveal a close uniformity with the Castle Creek and Bainbridge sites in New York (Ritchie 1949: 168). The occupation embraces late Owasco, Chance, and Munsee components. Bowl and bell-shaped pits are predominant features, ranging up to seven feet in diameter and depth. Small, shallow bowl-shaped pits or hearths were used for cooking. The earlier pits held little evidence to suggest extensive agriculture, but they usually did contain sherds, varying quantities of cracked stones, charcoal, ash, and occasionally mussel shell, charred acorns, projectile points, and broken tools. Beginning with the late Chance phase (horizon), pits contained charred corn, cobs, husks, and charred grass linings.

The few postmolds found, mostly in Sections 3 and 4 (Fig. 19), do not provide any evidence of the type or arrangement of the dwellings which are presumed to have existed. A few postmolds partially surrounding two small burned-earth areas in Section 4 suggest the faint possibility of round single-family dwellings like those of the Sackett site (Ritchie 1965a: 286). There was no evidence of any form of fortification and in view of the archeological record perhaps none was necessary.

The economy during the early part of this occupation is confined largely to hunting, fishing, and gathering. Bone in the early pits is negligible due to the heavy clay content and extremely high acidity of the soil. Cylindrical pestles, mullers, and shallow mortars were much in evidence in pits with late Chance and historic Munsee pottery. Also present were shallow mortars and grinding stones which, as previously mentioned, may have been used to grind burned shale for tempering pottery (Fig. 34, Nos. 7, 14). Greater emphasis on corn is evident in the middle and final stages. Large storage pits are numerous, and several contain quantities of charred corn, grass, husks, and cobs. Notched and unnotched hoes made from thin or split pebbles of sandstone or siltstone (Fig. 34, No. 3) and occasionally quartzite (Fig. 34, No. 5) were found.

Net fishing played an important role in the economy as judged from the abundance of netsinkers. A total of 120 sinkers of both types was present. In comparison, only 68 were recovered from the Bell-Philhower site.

Ground and polished tools were relatively scarce. Woodworking was probably done with the celt and the narrow chisel (Fig. 33, Nos. 23, 24). The teshoa or woman's knife (Eyman 1968), consisting of a large, thick, primary flake from a sandstone or quartzite river cobble, was a general-purpose tool (Fig. 34, No. 6) with edge wear indicating such uses as cutting, scraping, and chopping. Evidently the tool was used in cutting meat and preparing hides. Secondary flakes, occurring most often in pits with mussel shell and fish bone, may have been used to remove fish scales. A new knife form is a large primary flake of siltstone with a ground edge (Fig. 34, No. 8). Surviving evidence of the bone industry is restricted to two fragmentary bone awls. Mammal bone, fish bone, and quantities of mussel shell are found in the pits.

Chipped and polished stone tools are few in number. Triangular points are small and of the "generalized" variety. Forty-two specimens, or slightly over one-third the number found at Bell-Philhower, were unearthed. With a few exceptions the remainder of the artifacts are identical to those from Bell-Philhower (Ritchie 1949: Table 2). The exceptions include the "pattern stones," a two-holed soapstone pendant with stylized face in relief; sinew stones; and a variety of bone tools and combs. Absent at Bell-Philhower are the following Zimmermann traits: ground knives of argillite and siltstone, abrading stones, stone phalli, shaftsmoothers, teshoa, and what I have called muller and hammer combinations. Properly, the latter should be called a combination hammer and grinding stone. It resembles the muller except that the flat surface is rough instead of polished.

Traits of local manufacture introduced into the basic late Owasco culture would include pattern stones, soapstone pendants with stylized faces, ground-edge knives, combs with pit and line decoration, trimmed sinkers and discs, shell gorgets, and shell bird and fish pendants.

The distribution of the ceramic series at Zimmermann in some 108 of 236 pits excavated provides a fairly accurate picture of the occupation and ceramic development. Table 2 deals with 25 of the 108 pits which best illustrate the various associations of pottery and other artifacts throughout the final phase of occupation. Some pits were obviously mixed due to intrusions into earlier occupational levels and a shifting over the years of the center of occupation. These intrusions were quite conspicuous as indicated by the contents of Pits 219, 229, and 232.

In view of the contents of Pits 80, 84, 90, 100, 108, and 130, which were restricted to pottery of Sackett Corded, Kelso Corded, and Castle Creek types in Sections 3 and 4, there appears to be an early occupation of Level 1 by a small group representing the Castle Creek phase.

Shortly after this initial occupation numerous mixed situations are present. Early Ontario Iroquois and Oak Hill types (Lenig 1965: 70) occur in association with late Owasco sherds in several pits. Lanorie Crossed intrudes into a Munsee pit in Section 2. Niagara Collared occurs with Kelso Corded stylus-punctated collar (Fig. 37, No. 1), Chance Incised, fragmentary rims of an untyped ware with crisscross lines on the lip and oblique incised lines on the rim, and a fragmentary rim of a corded collar in Pit 197, Section 1. Ontario Oblique (Fig. 32, No. 4) is associated with Durfee Underlined and Dewongo Incised (Fig. 32, Nos. 1, 6) in Pit 2, while a matching sherd of this type from Pit 17 was associated with Otsungo Notched Lip. Lanorie Corded (Fig. 37, No. 3) or an early variant of the type is present in Pit 96 with Kelso Corded, Sackett Corded, Castle Creek Incised Neck, Castle Creek Corded Neck (Fig. 37, No. 14), and platted punctate (Fig. 29, No. 2). Lanorie Corded was found in a second pit, dug in 1969, containing Kelso Corded, which in the east end of Section 1 is not included in the present inventory.

Oak Hill Corded is not present and its appearance in the area appears to have been brief. The interrupted-linear technique (Fig. 38, Nos. 8, 9) also has a brief flare but is soon replaced by incised

(Tribal) types: Chance Incised, Deowongo Incised, and Durfee Underlined. The popularity of these types increases and they come to constitute over 21 per cent of the total number of rims. These types occur in 16 pits, with Chance Incised present as a single type in four pits and Deowongo Incised as a single type in one pit.

The following associations are observed:

Chance, Deowongo, and Durfee
Chance, Durfee, and Wagoner
Chance, Kelso, and Deowongo
Chance, Kelso, and Otstungo Notched Lip
Deowongo, Durfee, and Garoga
Durfee, Garoga, and Wagoner

The latter part of the phase reveals a greater dependency on corn agriculture. Hoes are present in three pits, and charred corn occurs in a like number, while pestles and muller occur in eight pits. One pestle was found in an early Chance Pit 206 and one in a late Owasco Pit 96. Fishing also takes on a more important role as indicated by an increase in the quantity of netsinkers.

The final ceramic style is Munsee Incised, and its transition from local protohistoric variants of eastern Iroquois pottery types is complicated and involves such types as Deowongo Incised, Durfee Underlined, Otstungo (subtypes Kingston Incised, Hudson Valley Incised, and Hudson Valley Crescent), Cayadutta Incised, and Fonda Incised. Several authors have described Munsee Incised, and a discussion of this type appears elsewhere in the present work. While a complete study of the problem is beyond the scope of the present paper, some observations are pertinent at this time.

Evidence from the Zimmermann site indicates that the earliest use of the diagnostic carbonaceous paste with abundant mica, which is characteristic of Munsee Incised, occurs on a variant of Durfee Underlined (Fig. 32, No. 1). This variant has small oval punctates at the top and the base of the collar, which is a trait of Kingston Incised. Thus, this specimen has attributes of Durfee Underlined and Otstungo in late prehistoric times.

With the advent of Otstungo Incised (MacNeish 1952: 76) or Garoga Incised (Lenig 1965: 6) (subtypes Kingston Incised and Hudson Valley Incised), a series of developmental changes begins which leads to the motifs recognized as Munsee Incised. Earlier examples of Otstungo are present at the Zimmermann and Davenport sites, and it appears likely that some of these earlier prehistoric examples may have eventually overlapped Munsee styles in early historic times. Typical fragmentary sherds of this type from Zimmermann have the ladder-type design and broad basal notching. They were found largely in the middens and topsoil in Section 2.

During the early historic period some of the traits which distinguish Munsee Incised from earlier forms appear (Fig. 38, Nos. 11, 12, 14, 17-19). The small, oval punctate and opposed line designs are present on the basic Otstungo motif. The opposed line or V-shape takes the form of a zigzag superimposed on a rectangular plat (Fig. 38, No. 11) or as a break between plats of opposed, oblique lines (Leslie 1968b: Pl. VI). It occurs inverted at the base of the collar (Fig. 38, No. 19) and on the lips of collared (Fig. 38, No. 14) and collarless forms (Fig. 38, No. 16). The latter is referred to as Munsee Oblique (page 474). It also occurs at Davenport, where it was found in a pit with a brass kettle lug, a thin, circular iron disc (button form), koalin pipe stem, and cut brass scraps. Other pits included an iron awl and bracelet with Munsee Incised ceramics.

The earlier historic forms of Otstungo have a flat lip, occasionally decorated with incised lines, including the opposed lines mentioned above. There also occurs a thick collared form with a 90-degree angle at the base of the collar (Fig. 38, No. 15). All sherds of this type from Zimmermann and in tests in the Munsee cemetery, near the Bell-Browning site, have the stylized face effigy beneath the castellation.

Later, high-collared forms of the Otstungo Incised type are present at Zimmermann (Fig. 38, No. 21) and Herring No. 1. These late forms have narrow, rounded lips, a variation which may be of local origin. This form in its late stage no longer resembles Otstungo (Fig. 38, No. 22). The collar is concave and contains numerous diamond-shaped plats filled with opposed lines, and triangular plats filled with crossed lines. The stylized face effigy is centered in a large diamond plat beneath the castellation. This form of Munsee Incised must certainly overlap the final stage motifs of the double-collared forms, although actual associations have not been found. Diamond-shaped plats occur on Figure 36, No. 2.

During the final stage of the motif there are some remarkable resemblances to Susquehannock Schultz Incised (Fig. 36, No. 1) and, in what may be one of the final examples of the motif, there is a blend of Susquehannock and Munsee (Fig. 36, No. 2). This final ceramic stage would probably encompass the early part of the seventeenth century. Sherds of Overpeck Incised (Fig. 38, No. 6) and others of indeterminate origin (Fig. 38, Nos. 4, 23) suggest contact with other groups. Intermarriage may be responsible for some of the aberrant styles present.

The presence in Pit 116 of a fragmentary kaolin pipe with an "R. Tippet" mark in association with scraps of cut brass may signal the termination of the Munsee occupation at Zimmermann. The presence of glass beads, a pewter pipe, and shell runtees in the Munsee cemetery (Heye and Pepper 1915) would seem to indicate that at least part of the main band remained in the area until the latter part of the seventeenth century.

The excavation of the Zimmermann site has greatly enhanced our knowledge of prehistoric material culture from the Late Archaic to the dawn of history. It has added significant data relevant to the patterns of life and movement of the prehistoric peoples of the Upper Delaware Valley.

Port Jervis, New York

Bell-Browning Site

28-Sx-19

PATRICIA MARCHIANDO*

INTRODUCTION

RESEARCH OBJECTIVES

THE BELL-Browning site was located by an archeological field party from the New Jersey State Museum in the summer of 1967. This discovery was the result of intensive archeological testing in Warren and Sussex counties in anticipation of the eventual inundation of the area by the proposed Tocks Island Reservoir. Our goal over the last 10 years of research in the Upper Delaware has been to contribute to a better understanding of the culture history of the area.

The importance of the Bell-Browning site was realized when objects of European manufacture were found in direct association with native goods. Subsequent excavations in 1968 were specifically directed toward locating features which would provide more data on settlement patterns. The plan was to uncover as much of the occupation area as possible and from the accumulated data determine the extent of the settlement, approximate size, design, and number of dwellings, as well as to estimate the gross population.

The excavations of 1968 provided more information on native artifacts and their associations with European trade goods. However, the search for evidence of house structures was disappointing since the postmolds were randomly distributed on the site plot. Another attempt will be made to uncover this valuable information.

The following is a detailed report on the excavations to date.

LOCATION AND DESCRIPTION

The site lies two and one-half miles south of the Milford, Pennsylvania-Montague, New Jersey, toll bridge, east of the Old Mine Road and opposite Minisink Island in the state of New Jersey. The site can be located at 41 degrees, 16 minutes, and 51 seconds north latitude, and 74 degrees, 49 minutes, and 30 seconds west longitude. It is situated on the second lowest terrace of the flood plain, 400 feet above sea level.

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Although farmed in the past, the field lay fallow for the 10 years preceding the excavation in 1967. According to the original owner, Burson Bell, and the present owner, Colin Browning, the area excavated by the New Jersey State Museum had not been previously excavated or searched by amateurs or professionals because of the heavy cover of grass, and because the site was situated so close to the house that permission to search this field was never granted.

The site surface is quite level, but along the eastern boundary it rises slightly, while the terrain immediately to the west of the site drops sharply to the lowest terrace. A stream bed between the site and the farm house is dry most of the year and flows only after a season of heavy rain. Oaks, elms, black walnuts, and scrub growth dominate the area.

The excavated portion of the site covers 16,000 square feet. The vertical composition was determined by testing in two sections of the site, 5 feet by 10 feet, to a depth of 6 feet. The dark brown topsoil measured 10 inches to 22 inches thick. The topsoil is underlain by a 24- to 36-inch deposition of fine, yellow, sandy gravel. The second subsoil deposit, composed of a heavy, yellow sand and gravel mix, reaches a depth of at least 70 feet. (The Brownings had a well dug to a depth of 70 feet.) Stephen J. Toth, Rutgers, The State University, analyzed the soil from the two levels. The pH value for the 24- to 36-inch layer is 6.4 and for the 36- to 72-inch layer the value is 6.5. Mildly acid soil conditions are indicated.

Minisink Island, noted frequently in the literature as an important place on the aboriginal trade route to the west and east and as a major settlement for the Lenni Lenape Indians of both prehistoric and historic times, lies three-eighths of a mile west of the site. This island has been intensively farmed for nearly a century and is being partially stripped of topsoil by its owner, Charles Brace. Permission has not been granted for archeological testing on this island.

History of the Site Area

Few early accounts of the native populations of the Upper Delaware Valley exist. However, eighteenth- and nineteenth-century missionaries and historians, such as E. M. Ruttenber (1872), James P. Snell (1881), John Heckewelder (1876), and David Zeisberger (1885), left records of the regional colonial-period Indians. Their references to the Munsee and the village of Minisink are of particular interest here. These writers described the region as a "capital," a "seat of the tribe," a trade center, a place where the tribal fires are kept, and the "council seat." Obviously, Minisink village was an important settlement. According to these accounts, the village was located approximately 10 miles south of Mahackemack in New Jersey. Van der Donck's map of 1656 places two Indian villages in this area. A 1747 map shows an Indian trail from the Shrewsbury River to the Delaware River, ending at "approximately the place where Minisink village and its burial ground were situated" (Heye and Pepper 1915: 11).

The Dutch were the first to settle in the Upper Delaware. Undocumented history or local folklore has them entering Warren County in the early 1600's. The copper ore in the Kittatinny Range, about seven miles north of the Delaware Water Gap, attracted the Dutch trading companies. They worked the Pahaquarra mines and transported copper to Esopus (Kingston), New York, from whence it was shipped to Holland. The Dutch used the Old Mine Road, which was the first colonial highway of over 100 miles, for transporting copper to New York. Originally an Indian trail, this road allegedly passed the Minisink village area; thus contact of a continuing nature with the native peoples was established early. These early miners probably did not settle in the Minisink area at that time since they were interested primarily in the mines, 25 miles to the south (Decker 1942; Hine 1952).

The fertile lowland of the Delaware Valley attracted Dutch settlers in the mid- to late 1600's and early 1700's. They first settled opposite the lower end of Minisink Island, probably on the second lowest terrace, "just at the foot of the ridge running parallel with the river" (Heye and Pepper 1915: 11). Records of land holdings at this time do not exist. However, a relatively large number of people probably settled in the area since, by 1701, the Provincial Assembly of New York had established a voting precinct for the residents of Wagachemick (Neversink) and Great and Little Minisink islands (Snell 1881: 361-2).

Europeans and Indians lived in relative harmony for a number of years until land became an issue of conflict. Pressure from the Europeans forced some of the Munsee to relocate. As early as 1690 a small band left the Upper Delaware to join the Ottawa.

The Bell-Browning site is located on property first settled by Johannes Westbrook prior to 1726. In a deed of 1730 (Westbrook Family History, December 20, 1730) it is shown that Westbrook purchased 100 acres of land from "Tycop, Indian of Minisink," for a total of five pounds. The deed states that the land purchased from Tycop included the area where the Westbrook house and barn stood, thus indicating that Westbrook was living there and farming the land before 1730. The farmhouse, barn, and much of the land has remained in the Westbrook-Bell family into the twentieth century.

The archeological potential of the area was first realized at the end of the nineteenth century. Beginning in 1899, the tract of land then owned by Burson Bell and Charles Philhower (now owned by Browning and Winant) has been excavated by many professional and amateur archeologists.

Unfortunately the work of Maxwell Somerville, University of Pennsylvania, the first professional investigator, was not published and his collections were apparently lost. In 1901, Edward S. Dalrymple, a private collector from Branchville, New Jersey, excavated in the northwest section of the burial site later investigated by George G. Heye and George H. Pepper, Museum of the American Indian (Heye and Pepper 1915: 2). The cemetery was located on the first terrace opposite Minisink Island. Dalrymple removed 15 graves, some dating from the historic period. One individual, a child, was interred with a copper kettle, a silver spoon, 2 glass beads, 11 thimbles, a bell, a bone comb, and 8 copper bracelets on the right wrist (Heye and Pepper 1915: 17-8).

In 1914, Heye and Pepper excavated portions of the same cemetery site where Dalrymple had worked and removed the remains of 45 skeletons. They concluded that the site was inhabited until the early eighteenth century after years of contact with Europeans. Numerous trade items were found in the graves, and the skeleton of a European was found in the cemetery (Heye and Pepper 1915). Artifacts of aboriginal manufacture included many Iroquoian and Munsee pottery types. The skeletal material was analyzed by Ales Hrdlicka (1916).

In 1925, the site was again investigated by the Museum of the American Indian, Heye Foundation, although the director of the excavation, Edwin Coffin, did not publish his findings. From 1933 until 1962, Charles A. Philhower, an amateur archeologist, dug trenches and pits in various parts of the site. In his years of searching he uncovered over 200 storage and refuse pits and from 175 to 200 graves (Ritchie 1949: 161). Upon his death, Philhower's collections were given to Rutgers University where they remain in packing cases in the University Library basement.

Ritchie excavated on the Bell and Philhower properties in 1947, and he uncovered 100 pits in the area just south of and contiguous to Heye and Pepper's excavations. These pits had been used primarily for storage of horticultural products. Fifty-five per cent were found to be empty, the rest contained refuse and burials. Ritchie's evaluations and interpretations of the pits are discussed in a following section.

The New Jersey State Museum spent two seasons at the site—two and one-half months in 1967 and 1968, totaling 110 days. The excavated area yielded 293 features, 10,402 stone, bone, and ceramic artifacts, and more than 10,000 stone waste flakes.

Technique of Excavation

A bulldozer was used to remove the topsoil. An L-shaped grid pattern of five-foot squares was placed over the site locality, resulting in a total area excavated of 16,000 square feet. Standard New Jersey State Museum feature forms were used for recording hearths, pits, postmolds, and burials. Black and white as well as color photographs were taken of all features.

Features (Fig. 40)

The 293 recorded features include 270 fire, cache, storage, refuse, and burial pits and 23 postmolds. The greatest concentration of features is on the western edge of the terrace. The features are discussed in three broad categories: burials, other pits, and postmolds. Since the number of pits is so great, only those which contained pertinent data are discussed in detail.

Burials

Of the nine burials, five are human (three adult and two immature), three are dogs (two mature, one immature), and one is a bear cub.

Pit 129 was the grave of a child, five to seven years of age. The pit fill contained flecks of charcoal, and larger pieces occurred just above the bones and a very dark charcoal stain surrounded the skeleton. The body had been placed on its right side in a flexed position, with the face toward the west and head to the north. Preservation was extremely poor and the only salvageable pieces were fragments of the

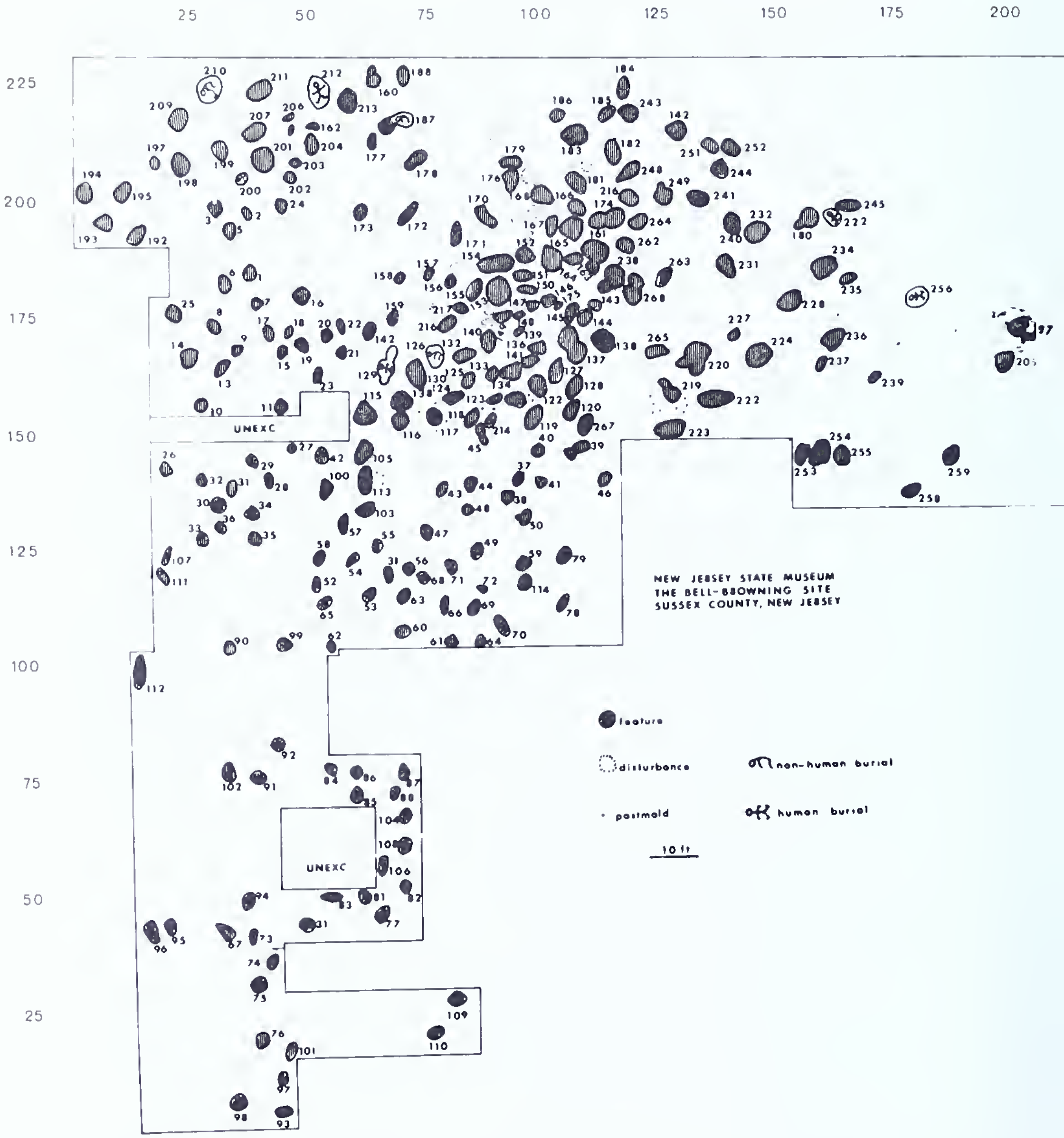

Fig. 40. EXCAVATED AREA OF THE BELL-BROWNING SITE, 1967-1968 excavations.

skull cap, mandible (with several primary teeth in place), long bones, and a small fragment of pelvis.

Artifacts found in the pit included 2 pitted hammerstones, a worked stone flake, 2 triangular stone projectile points, 2 stone projectile preforms, 1 handcut nail, 75 waste flakes, and mammal bones. The child was apparently buried in a refuse pit which was 24 inches below ground surface. No artifacts found in the pit can be considered grave goods, and from the circumstances of this burial it appears that a young child was merely placed in an available refuse pit at death.

Pit 212 held the well-preserved skeleton of an adult male 18 inches below ground surface. The man had been buried in a flexed position, with his head to the north, facing west. The skeleton was tightly flexed, with hands to the face and knees to the chest. None of the associated artifacts can be said to have been grave offerings. The bulk of the finds listed below were situated below the burial (30 inches below the pit surface). This burial appears to have been intrusive to a refuse pit. Artifacts include a stone knife, 2 stone scrapers, a worked stone flake, a netsinker, a chopper, 6 hammerstones, 2 anvils, 128 stone waste flakes, a Chance Incised vessel, and a Munsee vessel.

Pit 222 was encountered by the bulldozer during topsoil removal operation, and it was found to contain a human burial only eight inches below ground surface. The bones of this adult were in extremely poor condition; only the pelvis and lower extremities were preserved. The body had probably been facing west with head to the south. No artifacts were associated with this burial.

Pit 200 contained the burial of a child of approximately five or six years of age. The body had been placed on its right side in a loosely flexed position with the head to the north and facing west. Bone preservation was poor. Secondary teeth, ready to erupt, were observed in the mandible. All teeth found in place were primary. There were no artifacts associated with this grave.

Pit 256 contained the remains of an adult human of undetermined sex. The poorly preserved bones were too fragmentary to determine the position of the body. Salvageable bones included a fragment of the pelvis and portions of long bones. No artifacts were present.

Pit 55 contained a dog burial 28 inches below ground surface in an excellent state of preservation. It appeared to be a large animal, and lay on its left side with head to the northeast. The dog was discussed with John Guilday, Carnegie Museum, and with Barbara Lawrence, curator of mammals, Harvard University. Lawrence believes that the animal falls within the range of variation of Indian dogs of the Late Woodland period. No artifacts were found in direct association, but the pit contained a few implements, including a sandstone hammerstone, a worked stone flake, 13 stone waste flakes, and 19 sherds.

Pit 210 contained the remains of an immature dog, 33 inches below the top of the pit and 48 inches below the ground surface. The animal was buried in a foetal position with head toward the east and the face to the south. It was impossible to salvage any of the osseous material. Directly associated with the pup was a small Munsee vessel, and the pit also contained an antler fragment, a stone point fragment, and 13 stone waste flakes.

Pit 126 was an adult dog burial located 13 inches below the surface. The bones were in extremely poor condition; only the skull and a few vertebrae survived. The head was to the northwest, and the animal faced east. Artifacts found in the pit fill include two sandstone hammerstones and eight chert waste flakes. No refuse material was found in the pit, indicating that a separate and special pit was prepared for the burial.

In Pit 187A, a bear cub was found buried on its back, head to the west, lying along a west-to-east axis. The front legs were folded over its chest and the hind legs extended vertically. The ribs were missing, which may indicate bear ceremonialism with attendant care in the disposal of the animal.

There is evidence of bear ceremonialism at numerous sites in the Northeast. A comprehensive ethnographic study of this phenomenon was made by Hallowell (1926). An investigation of bear ceremonialism among Munsee-Mahican Indians was made by Speck (1945), and there has been archeological reporting of this trait by Ritchie (1947, 1950), Guilday (1961, 1962), and by Kinsey on pages 297 and 299-300 in the present work. Great care was always part of the ritual involving the method of killing the bear and disposing of the remains. It is obvious at the Bell-Browning site that this animal was treated in death with more care than humans, some of whom were interred in refuse pits.

OTHER PITS

These pits are classified as having been used for storage, refuse, caches, or fire. Cross sections of pits at the Bell-Browning site are illustrated on Fig. 2. The only correlation between contents and pit shape are those of straight-walled and flat-bottomed styles. These are usually sterile, possibly indicating food storage utilization, and in these pits, the fill is a fine yellow gravelly sand which is sometimes flecked with charcoal. Caches of clay are associated with this pit style. In four instances where potter's clay was the only material in the pit, these pits were of an identical type. They were about 24 inches deep, flat-bottomed, and had straight walls. The clay found in these features was apparently obtained from the banks of the Delaware River about one-quarter of a mile west of the site.

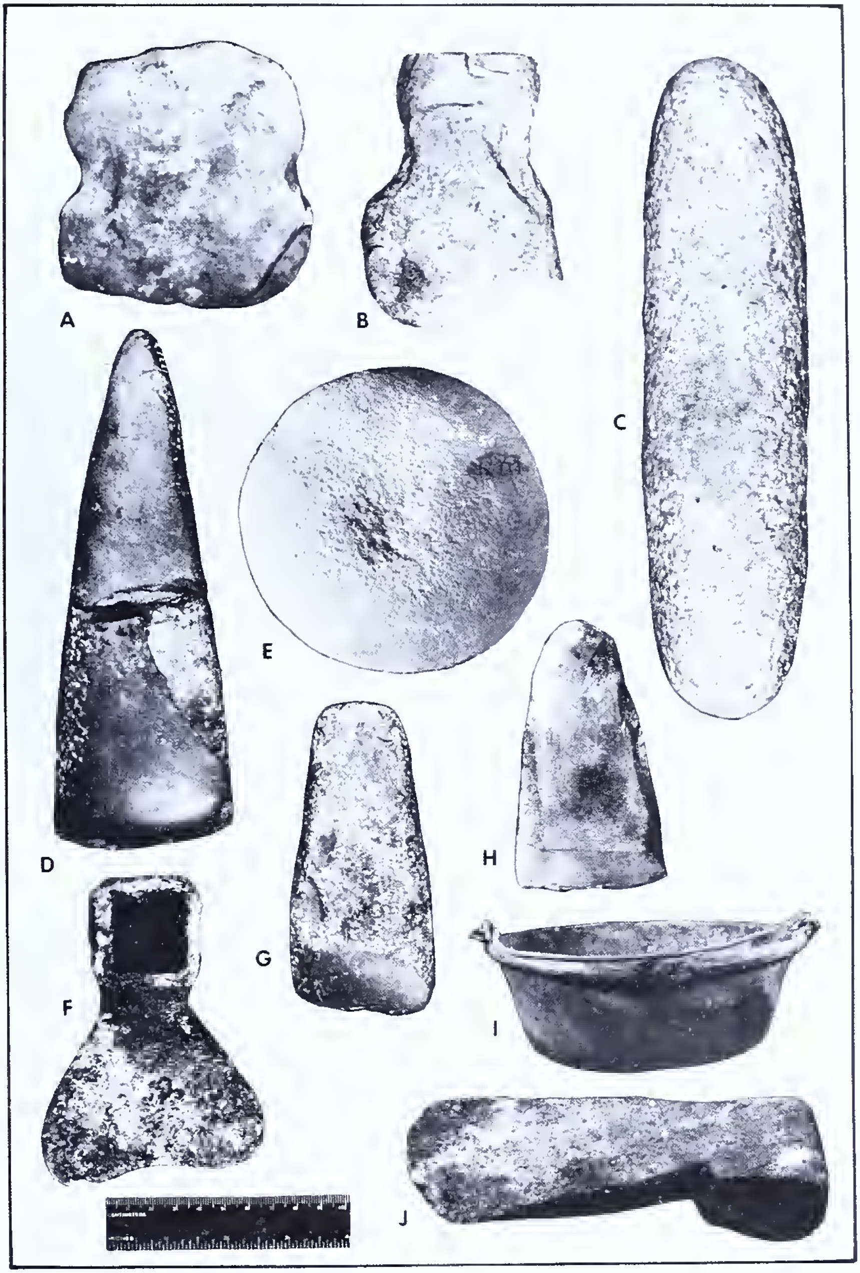

Fig. 41. NATIVE AND EUROPEAN ARTIFACTS from the Bell-Browning site: A, hoe, Pit 242, Mus. Cat. 17926; B, hoe, Pit 265, Mus. Cat. 18094; C, pestle, Pit 228, Mus. Cat. 17805; D, celt, Pit 174, Mus. Cat. 17217; E, pitted hammerstone, Pit 50, Mus. Cat. 15777; F, metal hoe, Pit 67, Mus. Cat. 15677; G, polished celt, Pit 26, Mus. Cat. 15503; H, polished celt, Pit 236A, Mus. Cat. 18071; I, brass vessel, Pit 34, Mus. Cat. 15572; J, iron axe, Pit 68, Mus. Cat. 15898.

POSTMOLDS

A total of 23 postmolds was recorded at the site. Definition was generally poor, and in all but one instance no discernible pattern was noted. Four postmolds were associated with Pit 117. They were situated around this feature in a manner suggesting a four-poled support for suspension of a cooking vessel. Measurements were taken of all postmolds, and they ranged from 2.5 inches to 4 inches in diameter, with two exceptional examples measuring 6 inches by 5.5 inches and 8 inches by 9 inches.

Because the historic accounts (Heye and Pepper 1915: 12) suggest that this might have been a palisaded village with an implied large population and numerous dwellings, the lack of evidence for structures is disappointing.

MATERIAL CULTURE

Items of material culture have been divided into two main groups on the basis of origin of manufacture, those of European manufacture and those of aboriginal manufacture.

The European artifacts found their way onto the site either through direct trade with Europeans (Dutch and English) or with Indians of other tribes who possessed them. In only a few instances is their appearance the result of mixing by plow or rodent action.

The artifacts analyzed in both sections below include only those found in the features; topsoil artifacts are not considered here. The topsoil specimens represent a mixture of materials from Late Archaic to modern times, and have value only in indicating the span of occupation of the site.

EUROPEAN TRADE GOODS

European trade goods include: 1) brass tools and ornaments, 2) tools and fragments of other metals, 3) ceramic artifacts, 4) glass ornaments and utensils.

1. *Brass Tools and Ornaments.* A small brass vessel measuring 3.25 inches high by 6.25 inches in diameter was found in Pit 34 (Fig. 41 I). The vessel is made of six pieces of brass. The body of the vessel is fashioned from a single sheet, slightly rounded, with a rolled, everted lip. Two handle supports, each made of two pieces of brass laid over the rim (one on the interior and one on the exterior) and joined to the vessel by two rivets form a lip which is .70 of an inch in diameter. The top edges of the supports are joined and bent at two corners. A

brass wire handle fits through pear-shaped holes in the supports and is bent up on the outside. The container is fire-blackened on the exterior surface, obviously from use over, or in, the fire. On the basis of method of manufacture, the vessel is dated to the mid-to-late seventeenth century.

A large bucket made of a copper alloy (Fig. 45 F) was found in Pit 39. The vessel is made up of eight sections bound together by 70 rivets. An iron handle, presently heavily corroded, was attached by looping each end through lugs and bending the metal on the outside of the handle.

The U-shaped lugs are round in section where the handle passes through, and flattened to tear-drop shapes where they are attached to the side of the bucket. They are joined to the body by two rivets on each side.

The lip is slightly everted, the result of hammering. The rim measures 2.9 inches (vertical) by 37 inches (circumference), and is attached to the body by a riveted strip (.5 of an inch) of copper. Twenty-seven rivets bind these pieces together. The rivets were heated, placed in the hole, and then made flush on the interior either by grinding or filing.

The body, 37 inches in circumference, is made up of two sections, being attached in two areas by a total of 12 rivets. These rivets were used in the same manner as those discussed above. The bottom, a single piece, one foot in diameter, is riveted from the bottom (27 rivets) with a slight lip folded on the outside over the side of the vessel. The container was perhaps formed by wrapping the sheets around a cylindrical object, possibly a tree trunk. The copper is of heavy gauge. This vessel had been variously mended by several techniques. Two holes were repaired by placing two small pieces of copper through the hole, then bending them in opposite directions. Six other holes on the bottom of the container were mended by a single rolled piece of copper which was heated, forced through the holes, and hammered into a flush position. These mends produced a raised surface both on the exterior and interior.

One hole lost its patch, since the opening buckles outward, with traces of a former patch visible around its outer edges. One mend area on the bottom was repaired by placing a piece of copper over the hole on the interior with one end bent through the hole and folded and hammered on the exterior surface. Another hole was mended by riveting a small sheet of copper to the side of the bucket with six

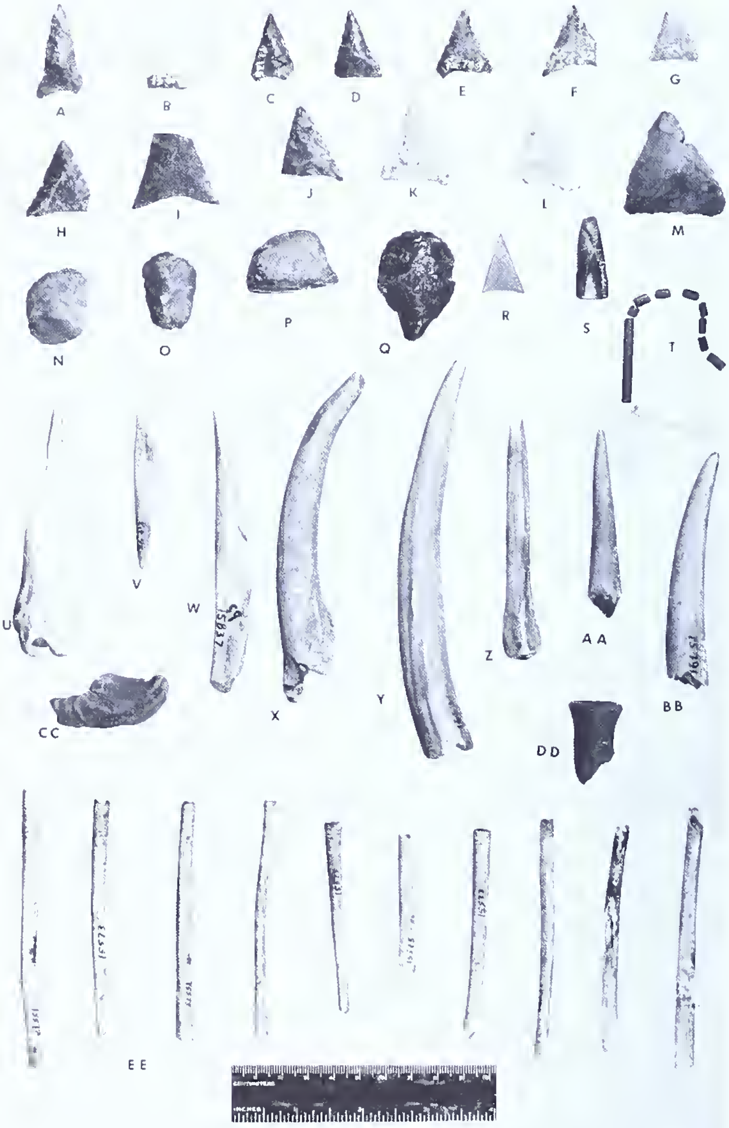

Fig. 42. NATIVE AND EUROPEAN ARTIFACTS from the Bell-Browning site: A-M, triangular projectile points; N-Q, snub-nosed scrapers; R, triangular brass projectile point, Pit 43, Mus. Cat. 15672; S, brass bead or jingler, Pit 242, Mus. Cat. 17915; T, tubular glass beads, Pit 35, Mus. Cat. 15574; U, bone awl, Pit 37, Mus. Cat. 15597; V, bone awl, Pit 45, Mus. Cat. 15703; W, bone awl, Pit 59, Mus. Cat. 15837; X, antler flaker, Pit 37, Mus. Cat. 15598; Y, antler flaker, Pit 50A, Mus. Cat. 15791; Z, antler flaker, Pit 161, Mus. Cat. 17042; AA, bone awl, Pit 161, Mus. Cat. 17042; BB, antler flaker, Pit 50A, Mus. Cat. 15791; CC, ceramic spoon, Pit 249, Mus. Cat. 17012; DD, ceramic smoking pipe, Pit 249, Mus. Cat. 17011; EE, incised bird bone beads, Pit 35, Mus. Cat. 15573.

rivets. The entire outer surface is heavily smoke-blackened, suggesting long use over a low-heat fire, and in view of the numerous repairs, must have been used over a long period of time.

A brass isoceles triangular projectile point (Fig. 42 R) was found in Pit 43. This specimen possesses the following attributes: it measures .90 of an inch by .70 of an inch, has a concave base, has striations perpendicular to the base, and is cut from a single piece of brass.

Two rolled brass beads or jinglers (Fig. 42 S) were found in Pits 219 and 242. They are identical in form of manufacture. One side is opened and the other is rolled or folded, the metal has been heated and is welded, but an opening is still present for passage of sinew or some other material. The ornaments measure 1.30 inches long and the rolled ends have bore diameters which average about 1.0 of an inch, and the opposite ends are .40 of an inch. These ornaments are similar to those found at the Ibaugh site (Witthoft, Kinsey and Holzinger 1959: 118).

Numerous fragments of brass sheet were found in the features. These specimens are small, averaging three inches in length. It is evident that they have been cut from larger pieces of sheet brass or from discarded utensils, such as plates or buckets. The surfaces are striated, apparently from a sharp implement which was used in cutting the material. These fragments were found in Pits 39, 43, 242, and 255.

2. *Tools and Fragments of Other Metals.* In Pit 61 a trade axe (Fig. 41 J) dated to the sixteenth or early seventeenth century was found. It is identified as a polless European utility axe fashioned of iron with a steel bit.

A total of eleven iron and brass fragments was found. These represent objects which are unidentifiable in terms of tool type (Pits 35, 45, 69, 97, 100, 104, 151, 198, and 222).

Hand-hewn nails comprised the bulk of the metal objects; 17 were found. Table 3 shows their distributions and sizes.

Table 3. Distribution and sizes of hand-hewn nails.

Pit No.	*Size*	*Incidence*
128	8d	1
142	8d	1
148	10d	1
165	10d	1
190	3d	2
202	10d	1
209	9d	1
218	12d	1
	10d	8

A pan cover and frizzen from a flintlock pistol found in Pit 35 is dated to the eighteenth century. This specimen, and an eighteenth-century flintlock plate (Pit 47), are associated with Munsee pottery.

An early seventeenth-century lock was found in Pit 43. This artifact, made of iron, is ball-shaped, with the shackle in an inverted U-shape with vestigial scrolled terminals.

3. *Ceramic Artifacts.* Twenty-two eighteenth- and nineteenth-century pottery sherds were found. Table 4 gives the provenience and description of these artifacts.

Table 4. Descriptions and locations of 18th- and 19th-century ceramics.

Pit No.	*Description*	*Approximate Date*
61	blue, tin glazed earthenware "delft," English	ca. early 18th
82	red earthenware, plate fragment	ca. late 19th
82	blue decorated English ironstone china	ca. 19th
67	blue decorated English ironstone china	ca. 19th
11	footed ironstone china plate	ca. 19th
82	redware	ca. 18th
67	mochaware	ca. early 19th
67	redware	ca. 18th
29	redware	ca. 18th

In all but one case, Pit 61, the sherds were found within the first three inches of the pit fill. These intrusions are attributable to plow disturbance.

Kaolin smoking pipes often provide a good time-marker for the archeologist, and a total of 11 stem and bowl fragments were found at the Bell-Browning site. The sample is not adequate to use the Binford system or even the Harrington method of dating pipe stem fragments. Binford's and Harrington's premise is that older pipes have larger bore diameters than later ones. We have three specimens with bore diameters of $\frac{8}{64}$ of an inch, three with $\frac{7}{64}$ of an inch, and two with smaller bores ($\frac{5}{64}$, $\frac{4}{64}$).

The pipe bowl found in Pit 220A is heelmarked with the initials "EB." This specimen is identical with one described by Sheppard (1912: case A, no. 23), "a small round bowl with milled line below rim; small heel, flat, stamped with the initials E.B., of an unknown maker." Sheppard dates this pipe to the latter half of the seventeenth century.

The majority of pipe fragments date to the mid-seventeenth-century period. These specimens were all removed from the pit fill and were unquestionably associated with late period Indian artifacts. The specimens from Pits 219, 220A, 242, and 248 are associated with Levanna-type projectile points; Pits 219 and 242 also contained rolled brass beads; and in Pit 242 was an opaque red cylindrical glass bead (1640-1675).

4. *Glass Ornaments and Utensils.* Ten glass beads were found; nine in Pit 35 (Fig. 42 T) and one in Pit 219. Except for a single example from Pit 35, these beads are tubular, opaque red with a dark core. The exceptional bead is opaque white, but similar in other respects to the red ornaments. These beads are identical to those described by Pratt (1961: 13), which he dates from 1660 to 1677. The specimens from Pit 35 are associated with the small brass vessel (Fig. 41 I), tubular bird bone beads (Fig. 42 EE), and Munsee pottery. The single glass bead from Pit 242 is associated with a rolled brass bead.

Only one utilitarian glass object was found, a drinking glass, probably a goblet. No date can be assigned to the goblet. This object is intrusive, probably the result of mixing by the plow; it was found on the surface of the pit.

NATIVE MATERIALS

1. *Stone Tools.* One thousand five hundred and twenty-five stone tools and over 10,000 stone waste flakes were found at the site. Brief descriptions of the stone implements follow.

PROJECTILE POINTS (Fig. 42 A-M). Ninety-three stone projectile points were found in the pits. The majority, nearly 70 per cent, are of the same general type, triangular, with the Madison type being dominant. Table 5 shows the distributions of projectile point types.

Table 5. Distribution of projectile point types.

Type	*Pit Number*	*Incidence*
Madison	16, 24, 26, 39, 41, 48, 50A, 84, 109 (2), 114, 116A, 119, 122, 123, 126, 127 (2), 128, 134, 136, 137A, 138, 141, 151, 153, 154 (2), 161, 164, 165, 171, 174, 181, 267 (2)	36
Levanna	37, 44, 49, 114 (2), 117, 141 (2), 146, 154, 263A	11
Generalized Triangular	26, 116A, 124, 126, 128, 130, 133, 138A, 113, 174, 181, 183, 216, 218, 219 (2), 221, 228, 268	19
Brewerton-Eared Triangular	138A, 235	2
Brewerton-Side-Notched	116A, 143, 219	3
Bifurcated-Stemmed	180	1
Generalized Side-Notched	221	1
Macpherson	128	1

Lackawaxen Converging Stem	130, 182	2
Straight Stem	130, 174, 215, 223	4
Expanding Stem	137A, 145, 149, 161, 215, 226, 228, 240	8
Perkiomen	139	1
Vosburg	194	1
Egypt Mills	165, 193, 195	3
	Total	93

Twenty-seven specimens are from components earlier than the Late Woodland; these include Brewerton, Macpherson, and Lackawaxen, to mention a few. The appearance of these points does not necessarily reflect early period occupation, but their presence here can probably be explained as being out of context due to plow, bulldozer, or excavation. They could also represent items collected as curiosities by the inhabitants from the Late Woodland period. In no instance were the early projectile points found in association with other tools from occupations prior to Late Woodlands.

Used Spalls. Fifty-three used spalls were found. All possess the following characteristics: they are elongated flakes which were removed from a large sandstone cobble, each exhibits a bulb of percussion opposite the working edge, and each shows signs of wear, all measure five to six inches in length and four to five inches in width. They were probably used for chopping and rough cutting.

Scrapers (Fig. 42 N-Q). Scrapers at the Bell-Browning site are ot two types, snub-nosed and flake. The snub-nosed are characterized by having one flat side, a thick round end, with the opposite end fashioned to a point. Flake scrapers have one edge worked, generally have a poorly defined shape, and are thin in cross section. Of the 65 scrapers 34 are of the snub-nosed form and 31 are flake scrapers. With the exception of one specimen, all are made from local flints. The exception is fashioned from either amber or slag (Fig. 42 Q).

Graving Tools. Three chert graving tools were found. These are manufactured from flakes which have a sharp projection modified to form a thin pointed tip.

Cores. The cores found at Bell-Browning are of two types: prepared and unprepared. The former type are characterized by a prepared striking platform, and usually are elongated. The unprepared cores are those which were selected by the artificer on the basis of shape and material after they had been broken by a heavy implement. The collection contains 104 prepared and 648 unprepared cores. All cores are cryptocrystallines, such as various jaspers, flints, and cherts.

Netsinkers. Three types of netsinkers were found at Bell-Browning: round, flat, double-notched pebbles; rectangular, flat, double-notched pebbles; and round grooved pebbles. The 52 netsinkers have average dimensions of 2.3 inches in length by 1.9 inches in width.

Pestles (Fig. 41 C). All ten pestles are cylindrical and are manufactured from gray sandstone. Five tools are complete. The average size of the pestles is 8.50 inches long by 2.50 inches in diameter.

Celts (Fig. 41 D, G, H). A total of 13 complete, fragmentary, or preform celts was found in the pits. The seven complete and two fragmentary specimens are polished, while the four preforms exhibit a combination of percussion flaking, pecking, and partial grinding of their surfaces. The celts are made from a fine-grained sandstone and range in length from five to nine inches, and in width from three to five inches.

Hoes (Fig. 41 A, B). Ten hoes were found. All specimens are percussion flaked from sandstone. Two types are represented: flat, notched, rectangular (similar to the netsinkers but much larger—six to eight inches), and a slightly beveled type, which has one tapered end and one end bifacially flaked.

Mullers. A total of 40 mullers was found at the site. These tools are disc-shaped and have one smoothed surface. All are manufactured of sandstone and measure from four to seven inches at their widest point.

Anvils. Thirty-five complete and fragmentary anvils were found in the pits. These sandstone tools have a scarred surface and they are all large (12 to 35 inches in the longest dimension).

Mortars. All 18 mortar and mortar fragments are made of sandstone. They all have a shallow, bowl-shaped cavity and are percussion flaked on their edges to form an oval-shaped tool. They measure from 11 by 6 inches to 24 by 12 inches.

Hammerstones (Fig. 41 E). A total of 270 whole and fragmentary hammerstones was found in the pits. The types include unpitted, single-pitted, and bipitted specimens. In all cases, evidence of use is exhibited at one or more points on the edges. In addition to the 270 single-purpose hammerstones, 14 combination hammerstone/abraders were found. These tools exhibit evidence of use as hammering implements. One was used to rub or grind. The average dimensions of the hammerstones is 4.5 by 2.5 inches.

Choppers. Twenty-three siltstone choppers were located. These tools are bifacially flaked by percussion. For the most part they are rather crude and all show signs of use. The average dimensions of the choppers are 4.3 by 3 inches.

WORKED FLAKES. Worked flakes include all flakes which were minimally modified for use. They are the waste products from cores or tool shaping. Edges have been unifacially worked, usually by pressure, and they were probably used as crude knives or scrapers. Forty-seven worked flakes were found.

DRILLS. A total of five drill fragments was found. Four specimens are shaft sections made of chert, and one specimen, lacking only the tip, is made of argillite and is reworked from a projectile point. All specimens are no larger than three inches.

BIFACES. A total of 22 biface fragments was found. The collection is made up mainly of black flint and chert specimens, which were pressure flaked for the most part. They have convex bases in the majority of cases, and frequently only one long edge is worked. The average dimensions of bifaces are 2.5 by 1.5 inches.

2. *Bone and Antler Tools.* Although only 18 bone tools were recovered from the pits during two seasons, this number is relatively high for the Upper Delaware area where the soil generally is extremely acidic. However, the mildly acid conditions of the Bell-Browning site help to account for the excellent preservation of bone and antler.

ANTLER FLAKERS (Fig. 42 X-Z, BB). Five antler flakers, made from tines, were found. They range in size from 3.50 to 6.75 inches in length. All show use at their tips. Two specimens have surfaces smoothed and polished from handling.

AWLS (Fig. 42 U-W, AA). Eight of the nine awls are made from the ulna bone of an artiodactyl, probably deer. They all exhibit sharp, smoothed tips and range in length from 2.50 to 4.50 inches.

PROBLEMATICALS. Three objects are of a problematical nature. One is a piece of worked antler, which has been cut near the tip, with two newly ground tangs. This artifact has a hole drilled just below the lowest tang. A second object is a small rectangular piece of polished, flattened bone. It measures 1.7 by .6 inch. The final unidentified object is a box turtle carapace, which is polished but broken so that only one-third of the shell remains. It could possibly be an ornament similar to the one found in the same pit (see ornaments).

BONE ORNAMENTS (Fig. 42 EE). A total of 34 bone ornaments was found at the Bell-Browning site. In Pit 35, 30 tubular bird bone beads were found in association with a brass vessel and glass trade beads. The average length of a whole bead is 3.82 inches. They are incised at both ends, and some have a dark red resin stain at the midsection;

it is believed that they were joined at this point to form an ornamental breast plate.

The remaining four specimens are polished, tubular bird bone beads ranging in length from 1.50 to 1.75 inches.

3. *Pottery* (Fig. 43-45). The pottery styles recorded for the Bell-Browning site indicate occupation from early Owasco through the later phases of the Late Woodland period. Early Owasco specimens are found, but they are less well represented than the later Iroquoian and Munsee types. There is clear evidence of Historic period occupation through the associations of European manufactured goods with aboriginal artifacts.

A total of 8,775 sherds (223 diagnostic rims and 14 restorable vessels) was collected from features during the two seasons. Specimens found in the topsoil are not included.

Included in the inventory of incised ceramics are Munsee Incised (25), Chance Incised (24), unidentified Tribal (121), Otstungo Notched (4), Durfee Underlined (4), Deowongo Incised (4) and Goodyear Lipped (1). Corded ceramics include generalized Owasco (20), Owasco Herringbone (6), Kelso Corded (13), Owasco Corded Collar (7), and Owasco Platted (13).

With the exception of the several specimens described below, the sample falls within the range of variation of the types discussed in the Appendix.

Four variant specimens from the Tribal Series are described below.

A small quartz-tempered vessel, Pit 210 (Fig. 43 E), was found 18 inches below the pit surface. It has a smooth surface finish and is decorated with incised triangular plats on the shoulder. The neck is incised with three horizontal bands. The slightly everted lip is similar to the Otstungo Notched Lip, but it is not notched on the interior edge. This specimen has a design similar to one illustrated by Lenig (1965: 38, Fig. 14 A), however, the design element there is executed by cord-marking rather than incising. This specimen was associated with Chance Incised pottery.

A small pot, Pit 53 (Fig. 43 G), approximately one pint capacity, was found 13 inches below the pit surface. This vessel is tempered with fine-grained quartz. The surface finish is smooth and the incised design elements are related to Durfee Underlined. However, the lip is everted and notched along its interior and exterior edges, a trait not normally found with Durfee Underlined vessels. Additional traits include a slightly constricted neck and a medium high collar. The associated objects are relatively undiagnostic, for example point tips, netsinkers, and other sherds too small to classify.

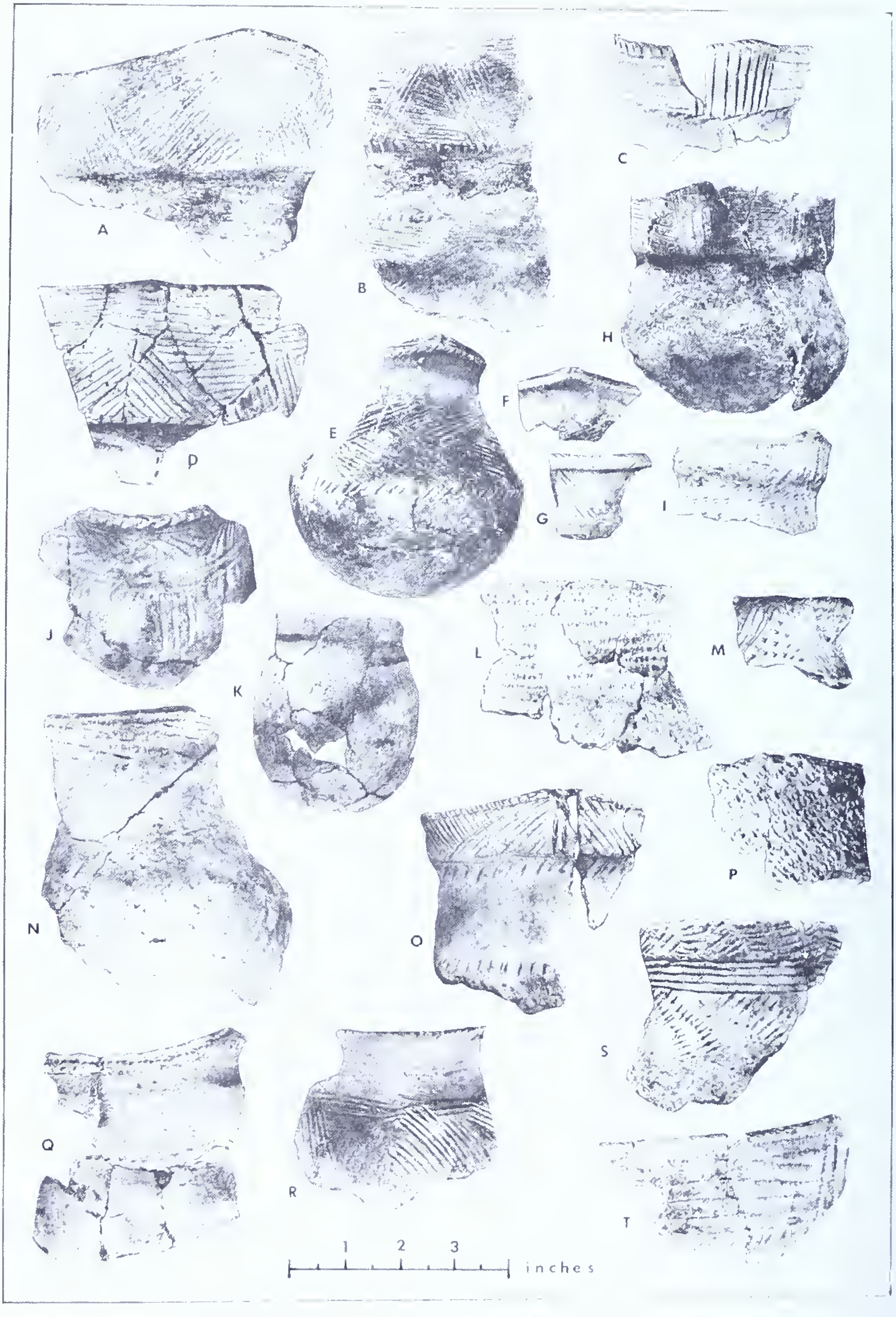

Fig. 43. OWASCO AND TRIBAL SERIES RIM SHERDS from the Bell-Browning site: A, Chance Incised, Pit 212, Mus. Cat. 17604; B, Munsee Incised, Pit 212, Mus. Cat. 17605; C, Chance Incised, Pit 222, Mus. Cat. 16056; D, Chance Incised,

This large vessel, Pit 193 (Fig. 45 A), has a capacity of approximately five gallons. It was located in the top six inches of pit fill. The rim decoration is typically Chance Incised. The neck of the vessel is smooth. At the shoulder is a band approximately six inches wide of mat impressions. Below this area is a 12-inch section of smooth surface finish followed by mat impressions which continue to the base of the pot. The total height of the vessel is 13.5 inches; rim diameter is 30 inches and body diameter is 39.5 inches. It is grit tempered with medium-sized grains. The color is reddish buff both on the exterior and interior. This specimen was associated with undiagnostic stone tools.

One-third of an unusually small pot, probably a toy, was found in Pit 238, 13 inches below the surface of the pit. This vessel is tempered with fine-grained grit. It is unevenly rubbed on the interior, the exterior has been smoothed over, but traces remain of the fiber (unidentified) which was used to rub it. It is poorly made and extremely thick for its size and is cracked (probably due to inadequate wedging of the clay). The rim is thin and the lip is slightly everted. The incisions on the lip give a scalloped appearance, though it is not truly scalloped. The neck has a series of five horizontal bands over rather sloppily incised diagonal plats. It appears as though this vessel was an attempt on the part of a child to make her own pot. This specimen was associated with an Owasco Corded Collar (Sackett Corded) sherd, seven incised rim sherds, a bone bead, and assorted stone tools.

Five variant vessels which exhibit cord-marked decorative motifs are described here.

A vessel, Pit 48 (Fig. 43 Q), representative of the Oak Hill horizon, was located 12 inches below the pit surface. This specimen is tempered with medium to large grains of grit and it has a smooth surface finish. The rim is out-flaring and the lip is everted; cord-wrapped-stick decorations are found on the interior and exterior edge of the lip. The neck is slightly constricted and a single line of punctations appears along the base of the neck. This vessel was associated with

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Pit 136, Mus. Cat. 16679; E, F, Otstungo Notched, Pit 210, Mus. Cat. 17569A, 17569; G, Otstungo Notched, Pit 53, Mus. Cat. 15803A; H. Munsee Incised, Pit 171, Mus. Cat. 17197; I, Kelso Corded variant, Pit 265, Mus. Cat. 18111; J, Chance horizon, Pit 103, Mus. Cat. 16029; K, smoothed-over cord-marked, Pit 243, Mus. Cat. 17936; L, Owasco Corded Horizontal, Pit 32, Mus. Cat. 15554; M, Oak Hill variant, Pit 1, Mus. Cat. 15360; N, Owasco, Pit 66, Mus. Cat. 15883; O, Chance horizon, Pit 46, Mus. Cat. 15729; P, Owasco, Pit 32, Mus. Cat. 15554; Q, Oak Hill Corded, Pit 48, Mus. Cat. 15752; R, Chance Incised, Pit 53, Mus. Cat. 15803; S, Owasco Corded Horizontal, Pit 218, Mus. Cat. 17687A; T, Kelso Corded, Pit 37, Mus. Cat. 15601.

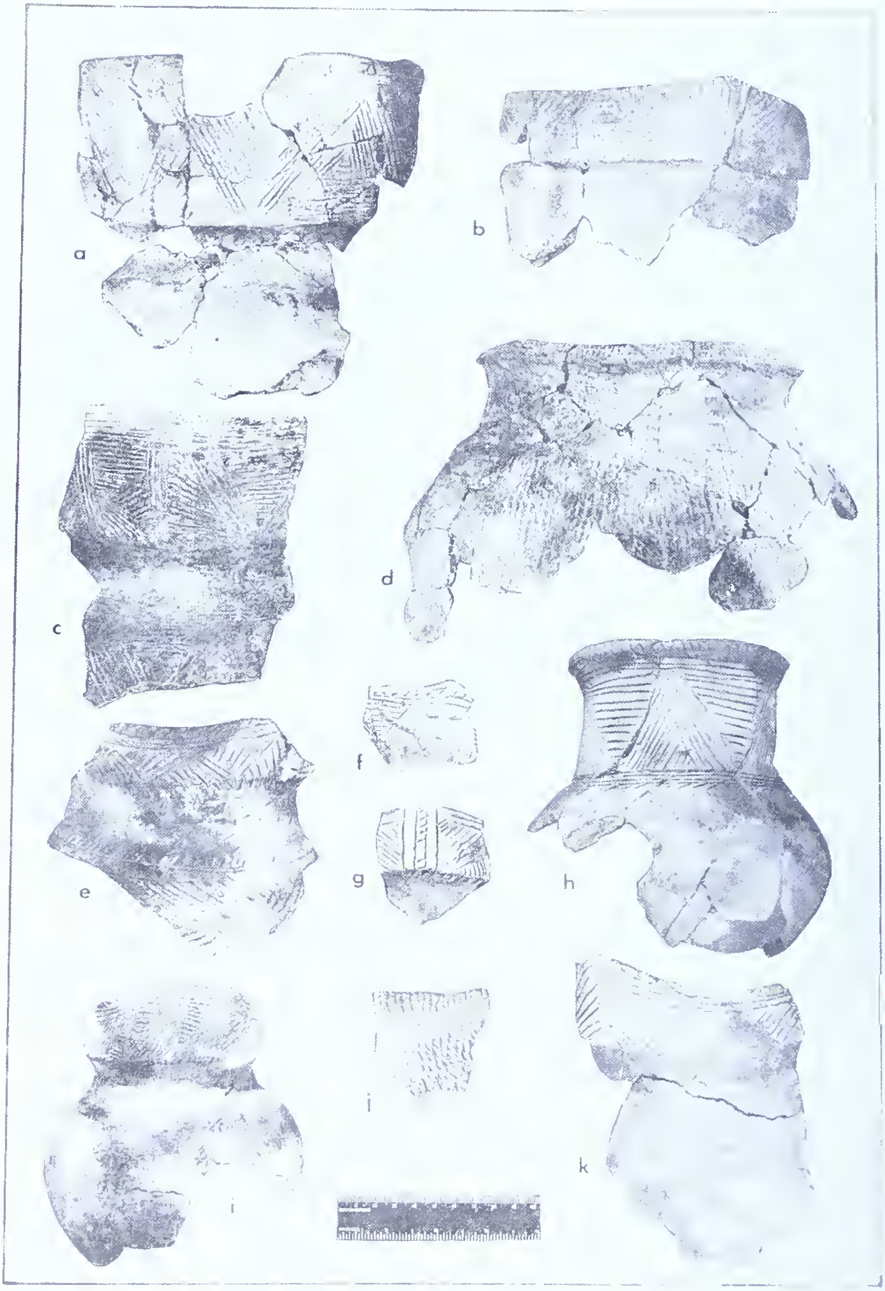

Fig. 44. OWASCO AND TRIBAL SERIES RIM SHERDS from the Bell-Browning site: A, Munsee Incised, Pit 143, Mus. Cat. 15531; B, Chance Incised, Pit 113, Mus. Cat. 16085; C, Munsee Incised, Pit 212, Mus. Cat. 17605; D, Owasco Corded Collar, Pit 14, Mus. Cat. 15444; E, Chance Incised, Pit 46, Mus. Cat. 15729; F, Munsee Incised, Pit 29, Mus. Cat. 15529; G, Munsee Incised, Pit 66, Mus. Cat. 15884; H, Otstungo Notched Lip, Pit 46, Mus. Cat. 15729; I, Munsee Incised, Pit 29, Mus. Cat. 15530; J, Owasco, Pit 185, Mus. Cat. 17386; K, Chance Incised, Pit 207, Mus. Cat. 17529.

Late Woodland artifacts, which include Levanna projectile points and Munsee-like pottery.

In Pit 66 (Fig. 43 N), a rim sherd from a large Owasco vessel, associated with Kelso Corded and Chance Incised sherds, was found 30 inches below the surface of the pit. This sherd exhibits the following characteristics: it is quartz tempered and the surface finish is smoothed-over cord markings with mat impressions appearing below the neck. The rim is slightly out-flaring and the outside is decorated by three horizontal rows of cord-wrapped-stick impressions, which are underlined in several places by interrupted incisions. The neck is slightly constricted.

Sherds of a variant Owasco Corded vessel (Sackett Corded), capacity of approximately six gallons, were found in Pits 218 and 263A (Fig. 45 D). This restored pot has the following attributes: the neck is horizontally cord marked (20 rows measuring 2.5 inches), and three bands of cord markings are present on the slightly everted lip. The interior of the lip has continuous vertical lines of cord markings. The body of the vessel is decorated with unusual rectangular cord impressions. At the shoulder there are four appendages, cord-marked vertical strips of clay, approximately eight inches apart and one and one-half inches in length. The vessel is grit tempered, with buff-colored exterior and reddish buff to black interior. It is 13 inches high with a body diameter of 39 inches. Twenty-two body sherds from Pit 218 are associated with a Levanna projectile point, a polished celt, a netsinker, and 70.7 grams of animal bone.

A small vessel, Pit 243 (Fig. 43 K), of approximately one pint capacity, was found 12 inches below the pit surface and was associated with several hoes, scrapers, a hammerstone, and deer bones. This specimen is buff colored with medium thick walls. The surface finish is smoothed-over cord markings and the rim and neck are also smooth. It has two castellations and a conical base.

A rim sherd from a small vessel, Pit 265 (Fig. 43 I), was found 12 inches below the surface of the pit. This specimen, a variant of Kelso Corded, is executed with corded punctates. The rim is decorated in horizontal bands of fine cording; at the castellation these cord marks are directed to the apex. Under the rim are cord markings produced in a fashion similar to the stab and drag method, where there is a tail from the mark. Fine quartz grit is used as temper. This sherd is associated with a Castle Creek Incised neck sherd, 334.3 grams of animal bone, carbonized beans, and nutshell.

Clay Pipes. Two fragments of clay pipes were found in Pit 249

(Fig. 42 DD). They were associated with a projectile point preform, a muller, a ceramic spoon (Fig. 42 CC), and 154 grams of mammal bones.

A pipe bowl has a smooth surface finish and fine-grained grit tempering and is buff colored with smoke-blackened interior. The decoration consists of short incisions perpendicular to the bowl rim.

The other pipe fragment is part of the stem and bowl, but is broken in such a way that it is undiagnostic. The surface finish is smooth and incised lines encircle the lower portion of the bowl.

Both specimens are undoubtedly Late Woodland types, but a more specific date cannot be ascertained.

CLAY SPOON. A clay spoon (Fig. 42 CC) was found in Pit 249, 22 inches below the surface of the ground. The spoon is tempered with medium-sized grit, it is buff colored on the exterior and interior surfaces, and the core is black. The surface finish is smooth, but the exterior of the bowl has impressions which appear to have been made with some type of fiber. The handle is broken close to the bowl; it has three incisions. The bowl measures 3.5 inches in length, approximately 1.3 inches in width, and .60 of an inch in depth.

This is the first clay spoon found, and it may be that it represents an attempt to copy European utensils.

OTHER MATERIALS

OCHRE. Thirty-two pieces of yellow and red ochre were found in the pits. These range in size from small marble-shaped specimens to elongated nodules measuring five inches by two to three inches. Some pits had an ochre stain but no salvageable pieces. The nearest sources for ochre are found east of the Delaware River in the Franklin, Sussex, and Hamburg regions.

MAMMAL REMAINS. A total of 6,821 identifiable mammal bones was collected from the features. A preliminary analysis has identified: deer, elk, bear, porcupine, beaver, rabbit, dog, and box turtle. Additional specimens are presently being identified by Guilday.

SHELL. The majority of over 30 pounds of shell collected at Bell-Browning is the common mussel *(Unionidae musculus)*. Several pond snails *(Polygyra* sp) were also found.

PLANT REMAINS. Refuse pits yielded remains of vegetable, fruit, and grain materials. Seven hazelnuts, four black walnuts, and several unidentifiable burnt nutshells were found in pits as deep as 25 inches below the surface of the ground. These were found in pits containing mammal remains, sherds, and stone implements. Approximately 50

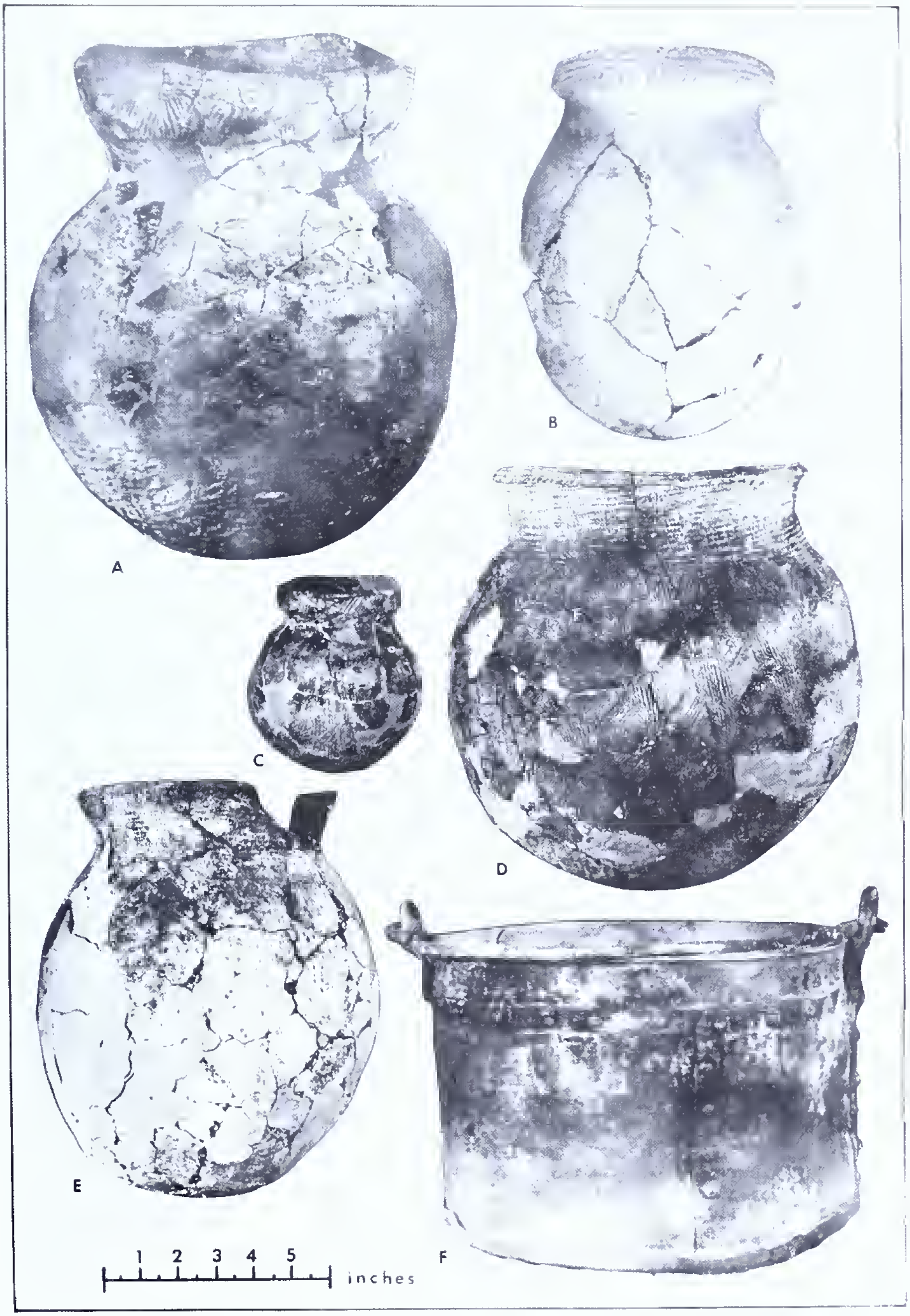

Fig. 45. OWASCO AND TRIBAL SERIES VESSELS and European bucket from the Bell-Browning site: A, Chance Incised, Pit 193, Mus. Cat. 17431; B, Oak Hill Corded, Pit 40, Mus. Cat. 16004; C, Chance Incised, Pit 54, Mus. Cat. 15812; D, Sackett Corded, Pit 218 and 263, Mus. Cat. 17682; E, Owasco Corded Collar, Pit 200, Mus. Cat. 17472; F, brass bucket, Pit 39, Mus. Cat. 15625.

kernels of burnt corn were found in the refuse pits. Associations are with refuse materials such as sherds, waste flakes, and animal bones. The corn has not yet been identified as to species. Charred bean remains were found in Pit 265. Identification of species is pending.

CLAY. In addition to the clay cached in special pits (see page 138), many of the features contained lumps of gray potter's clay. This material is easily obtained from an area one-quarter mile below the site.

SUMMARY AND CONCLUSIONS

Recent archeological investigations of the Bell-Browning site in Sussex County, New Jersey, illuminate the protohistoric period in this northern New Jersey area. Significant is the direct association of datable goods of European manufacture with objects of native manufacture, especially Munsee pottery. The object of our two years at the site, in addition to gathering information on artifact types and associations, was to assess local protohistoric demography on the evidence of structures and their arrangements within the site locality. We did not, however, attain this objective, for while some pertinent features, such as postmolds, were encountered and recorded, they were not found to occur in the essential numbers or patterns. Therefore, by necessity, discussion here is limited to certain reconstructions on the basis of artifactual material and pit information only.

From the numbers and types of features (273 refuse, storage, cache, and burial pits) excavated in the relatively small area (16,000 square feet), and the amount of refuse, it is our conclusion that a large population was maintained year around at the site. Historical sources substantiate this inference (Ruttenber 1872; Heckewelder 1876). Indeed, the physical characteristics of the site, which is situated near a mountain-fed stream on the second lowest terrace of the flood plain and which commands a view of the surrounding territory, suggest a suitable locality for a permanent settlement.

The artifactual material recovered from the features represents occupation from late Owasco times (Castle Creek phase) to the early colonial period. However, the majority of the types of pits noted above contained artifacts from the Chance phase and the later Munsee cultures. This statement is based on the type of pottery found.

The physical appearances of the features, as mentioned in a previous section, conform to the types illustrated in Figure 2. Functionally, they represent refuse, cache, and burial receptacles. Ritchie (1949: 166-7), as has been noted, excavated 100 pits; these pits were primarily for storage of horticultural products, as 45 per cent were sterile. Ritchie feels that since the 1914 Museum of the American Indian excavation located no historic objects in the pits, the practice of digging storage pits or of utilizing empty ones as refuse receptacles was abandoned at the time of European contact. He postulated that refuse, at this time, was disposed of by scattering it about the campsite, or by placing it in natural depressions, and by throwing it over an embankment, rather than by digging a pit (Ritchie 1949: 194). The New Jersey State Museum finds of 1967 and 1968 lead us to a different conclusion. European goods such as kaolin smoking pipes, glass beads, and copper and brass utensils and ornaments were found in pits in direct association with objects of native manufacture.

The association of historic goods and native objects is of prime importance for determining dates of occupation that have previously been left to inference. For example, objects such as kaolin smoking pipes and glass beads, recovered from the site, can be dated with fair accuracy (Sheppard 1912, Pratt 1961). At Bell-Browning, early and middle seventeenth-century pipes were found associated with native goods in pits that were deep enough not to have been disturbed by subsequent plowing or topsoil removal. As examples, kaolin pipes with dates ranging from 1620 to 1650 were found with Levanna and Madison projectile points, pestles, and Tribal sherds; pipes dated 1650 to 1680 were associated with Tribal sherds, rolled brass beads, breast plate. We dated these beads to 1660 to 1677.

Glass beads, another well-studied artifact type, were found in two pits. In Pit 35 there were 10 beads which were directly associated with Munsee pottery, a small brass container, and an incised bird bone breast plate. We dated these beads to 1660 to 1667.

The ceramic components represented in the site include late Owasco types such as Owasco Herringbone and Owasco Platted. Four pits contained Owasco Corded Collar and Kelso Corded sherds of the Oak Hill horizon; however, mixed in these pits were Chance Incised and Munsee pottery. (Chance Incised, Durfee Underlined, and Deowongo Incised ceramics represent the majority types at the site.) Finally, Munsee pottery, an elaboration of the Chance motif, appears in pits which contain Chance pottery and also in unmixed features. All ceramic vessels found at Bell-Browning are well made and the design elements are executed with precision. Here Munsee Incised is identified by the following characteristics: fine grit and quartz tempering, incised motifs of trianguloid and rectanguloid patterns, V-shaped plats, castellations, effigy faces, medium to high collars, and globular shape. Close affinities to some Susquehannock types are noted, but the major influence on the Munsee style is definitely from Chance Incised and the related types. Realistically, the sample is too small to provide criteria for establishing new sets of attributes for a Munsee type and/or subtypes; this material fits within the range of variation of those described by Witthoft (1959a: 51-6) and in the Appendix to the present work.

The 1,528 stone tools collected at the site are typical artifacts of the Late Woodland period. During the time period in question the occupants of the Minisink area were predominantly agriculturists; hunting, fishing, and gathering occupied subsidiary roles. Artifacts include hoes, celts, mortars, pestles, projectile points (Madison type dominating), and netsinkers.

The dominant stone materials are sandstone and siltstone river cobbles for pestles, mortars, and celts; and flint and local shale for projectile points, scrapers, and other chipped stone tools.

The vegetable and fruit remains found at Bell-Browning include corn, beans, squash, black walnut, and hazelnut. The animal bones which were found in the many refuse pits include deer, bear, beaver, and rabbit. The fish remains are predominantly shad. Freshwater mollusks were consumed in great quantity. In the excavations over 20.3 pounds of fresh water mussels were found. Foods not found archeologically, but which undoubtedly supplemented the diet, probably included berries, particularly blueberries, blackberries, and cherries.

All human burials were flexed and none contained grave offerings. During the 1969 work (not reported here) one individual was found buried with a dog.

Apparently, individuals from this village were buried in the graveyard excavated by Heye and Pepper (1915). This burial site was located some distance from the main settlement area. Many of the graves contained burial furnishings of both European and native manufacture.

The data presented here are descriptive and hardly exhaustive. Information on settlement patterns is needed to enlarge the understanding of this site. This objective will be our point of reference in future field research. An intensive survey of the surrounding area will be made to determine the limits of the village. However, the data accumulated have provided us with Munsee occupation dates that previously had only been speculative.

New Jersey State Museum
Trenton, New Jersey

Faucett Site

36-Pi-13A

W. FRED KINSEY, III*

Introduction

The Faucett site is on the lowest terrace of the flood plain near the river bank, about 23 feet above normal water level. It is 2.9 miles north of Bushkill, Pennsylvania, and can be located at 41 degrees, 07 minutes, and 12 seconds north latitude and 74 degrees, 57 minutes, and 40 seconds west longitude. The site is the property of Cornell Faucett, Bushkill, who leases it to Jack Van Auken for farming. It is a favorite area of local collectors for surface hunting, and the landowner has an extensive surface collection accumulated over a period of years from hunting these fields.

For a period of 10 weeks, from June 3 to August 9, 1968, 294 man-days were spent excavating the site. A site plot consisting of 282 10-foot squares was cleared and excavated. A bulldozer removed the topsoil, while the subsoil was spaded and flat-shoveled by hand to produce clean, level floors. For the entire site a total of 166 six-inch levels was excavated. One square was excavated by four natural levels, and this is equal to 12 six-inch levels. A datum point was established in order to make level determinations. As the excavations came to include a larger horizontal area, it became necessary to use a second datum because the huge mounds of backdirt prohibited continued use of the original datum.

Faucett site soil is tan-colored sandy alluvium of medium-sized grains. Few rocks occur naturally at the site. Although the site is stratified with at least four superimposed occupational zones in any given area, there is not a high degree of differentiation between the zones. There is very little organic staining, no ash lenses, nor fire-reddened soil. Nevertheless, it is possible to distinguish some differences in soil coloration. Grain sizes and texture are relatively

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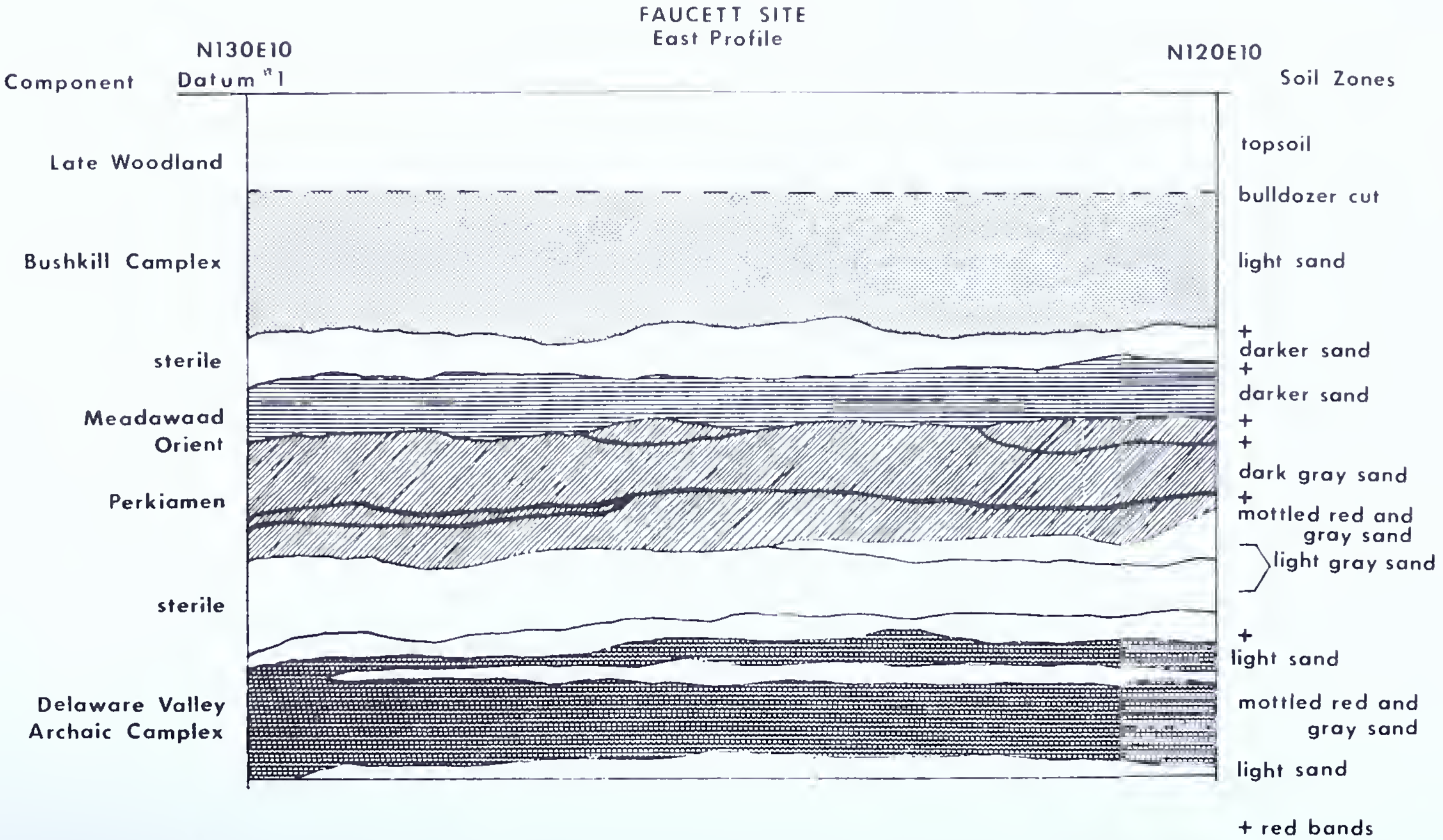

Fig. 46. DRAWING OF STRATIGRAPHIC PROFILE of a typical square at the Faucett site.

uniform, with the soil becoming stiffer and more clayey as the depth increases. From 108 inches to 156 inches B.D. 1, there are alternating bands of fine, tightly packed clay and slightly heavier and less compact sand. The east wall of Square N120E0 has a typical profile (Fig. 46). It is described as follows:

Depth from Surface	*Thickness*	*Description*	*Component*
Surface to 12″	12″ to 13″	humus-laden topsoil	mixed
12″ to 30″	16″ to 19″	light tan sand	Late Woodland pits, Bushkill
28″ to 35″	3″ to 7″	slightly darker tan sand with red bands of iron oxide stains	Bushkill
32″ to 43″	6″ to 8″	slightly darker tan sand lacking red bands	Meadowood
40″ to 52″	6″ to 10″	dark gray sand with charcoal flecks	Perkiomen
49″ to 58″	0″ to 7″	mottled red band with iron oxide stains	sterile
49″ to 58″	0″ to 7″	light gray clayey sand	sterile
56″ to 68″	6″ to 10″	light gray clayey sand	sterile
64″ to 70″	2″ to 3″	red band of iron oxide stains	sterile
67″ to 71″	1″ to 3″	light tan sand	sterile
69″ to 72″	0″ to 2″	dark gray, with mottled red iron oxide stains and charcoal flecks	Delaware Valley Archaic complex Brewerton Eared-Notched
72″ to 85″	9″ to 13″	gray with mottled red iron oxide stains and charcoal flecks	Delaware Valley Archaic complex Brewerton Eared-Notched
85″		light tan sand	sterile

This profile description does not include two short, narrow lenses which show on the profile drawing. It should also be noted that it does not include all major components known to be present at the Faucett site. Specifically, Perkiomen is shown as preceding Meadowood with the Orient component absent, but elsewhere at the site Orient follows Perkiomen and the Meadowood component is lacking. As expected, the distribution of the various components is staggered and they do not occur as a full sequence in any one area.

Two soil tests for acidity were made. The sample from Feature 115, Square S30W120, produced a pH value of 5.0. At 84 to 90 inches below datum in Square N110E0, the pH value was 5.8. The latter indicates mildly acid soil conditions while the former is the pH for strongly acid soil. This helps to explain the poor preservation of bone and other organic material.

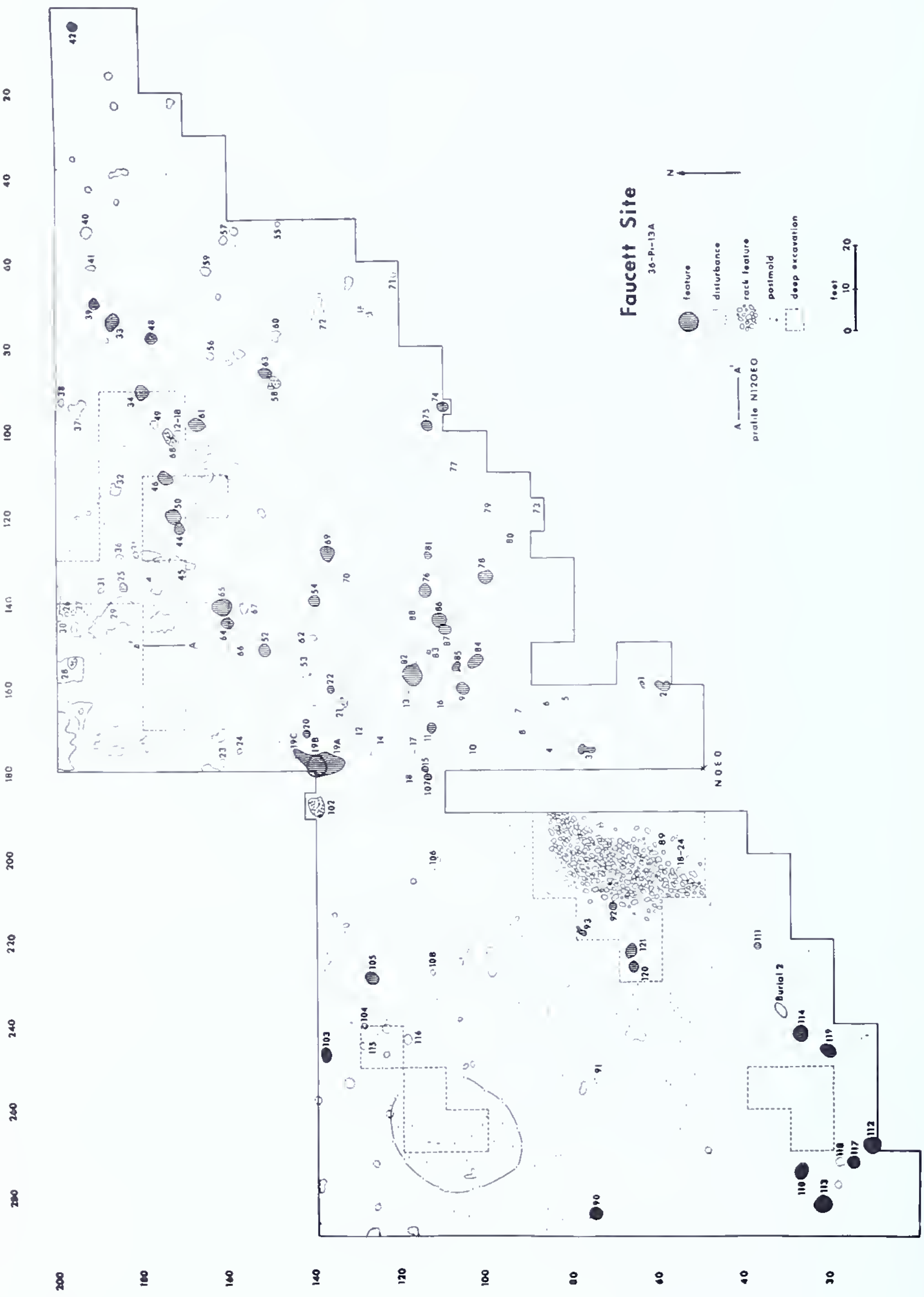

Fig. 47. EXCAVATED AREA OF THE FAUCETT SITE.

Table 6. Faucett Site Rock Lined Hearths.

Hearth Feature	Square	Level (inches)	Size (inches)	Associated Materials	Component	Shown on Site Plot
#13	N60W10	12″ – 18″ B.D.#1	32″ diameter	flint spall	Owasco or Tribal	Yes
#21	N80W10	12″ – 18″ B.D.#1	24″ to 36″ oval	Exterior Corded/Interior Smoothed sherds	Orient	Yes
#58	N90E70	12″ – 18″ B.D.#1	24″ to 36″ oval	Exterior Corded/Interior Smoothed sherds Rossville point	possibly Bushkill complex	Yes
#68	N120E50	12″ – 18″ B.D.#1	16″ to 22″ oval	Exterior Corded/Interior Smoothed sherds Rossville & Lagoon points	Bushkill complex	Yes
#89	N10W40 N10W60 N20W40 N20W50	18″ – 24″ B.D.#1	approx. 18′ to 40′ (feet) irregular	Exterior Corded/Interior Smoothed sherds Orient points	Orient	Yes
#93	N20W60	18″ – 24″ B.D.#2	12″ to 24″ oval	Exterior Corded/Interior Smoothed sherds Meadowood points	probably Meadowood	Yes
#97	N110E0	36″ – 42″ B.D.#1	18″ to 24″ oval	Perkiomen point	Perkiomen	No
#102	N80W30	12″ – 18″ B.D.#1	42″ diameter	Exterior Corded/Interior Smoothed sherds	uncertain	Yes
#123	N120E60	24″ – 30″ B.D.#1	36″ diameter	Orient points netsinkers	Orient	No
#125	S30W100	24″ – 30″ B.D.#2	42″ diameter	Orient points	probably Orient	No

FEATURES (FIG. 47)

There were 124 features pertaining to the aboriginal occupations of the site, which include burials, hearths, pits, disturbances, and concentrations. Sherds, chips, or other remains found in a living floor without being from a distinct man-made feature are considered as concentrations. Mostly, the seven concentrations were areas of trampled debris. Not all features could be shown on the site plot.

There were two burials. One was excavated during the 1964 site survey, while the second was uncovered in 1968 at the time of the major excavations. Poor preservation of the skeletal material prevents accurate age, sex, and morphological determinations.

There were no distinct pit outlines to the 1964 burial, and the pit was very shallow—only 14 inches from the surface to the top of the skull and 22 inches to the bottom of the burial pit. Possibly the individual was a young adult female although this is uncertain.

The 1968 burial was flexed and positioned along a northeast to southwest axis, with the head to the southwest. The individual may have been a young adult. This second burial was similar to the first in that the grave pit was also indistinct and shallow. Neither interment contained grave goods. A few sherds and spalls were found in the grave fill which probably do not relate to the burial practices of the group(s) responsible for the burials. It is probable that these are two Late Woodland burials, although it is impossible to ascertain whether they are Owasco or Tribal burials.

There were 10 rock-lined hearths varying in shape from circular to oval and ranging in size from about 12 inches to 42 inches across. The largest hearth, Feature 89, is irregularly shaped, measures about 18 feet by 40 feet, and is densely packed with fire-cracked rock. Detail on these hearths is provided in Table 6.

With the exception of postmolds, the 55 pits are the most numerous type of feature. These are classified according to cross-sectional shape as follows: bell (22), basin (15), deep basin (4), cone (5), shallow cone (2), and saucer (2). Profile drawings were not made for five small pits. Only three of the 55 pits were sterile.

Two hundred and seventy-nine postmolds were present. Only one configuration, near the western limits of the excavation plot, in the

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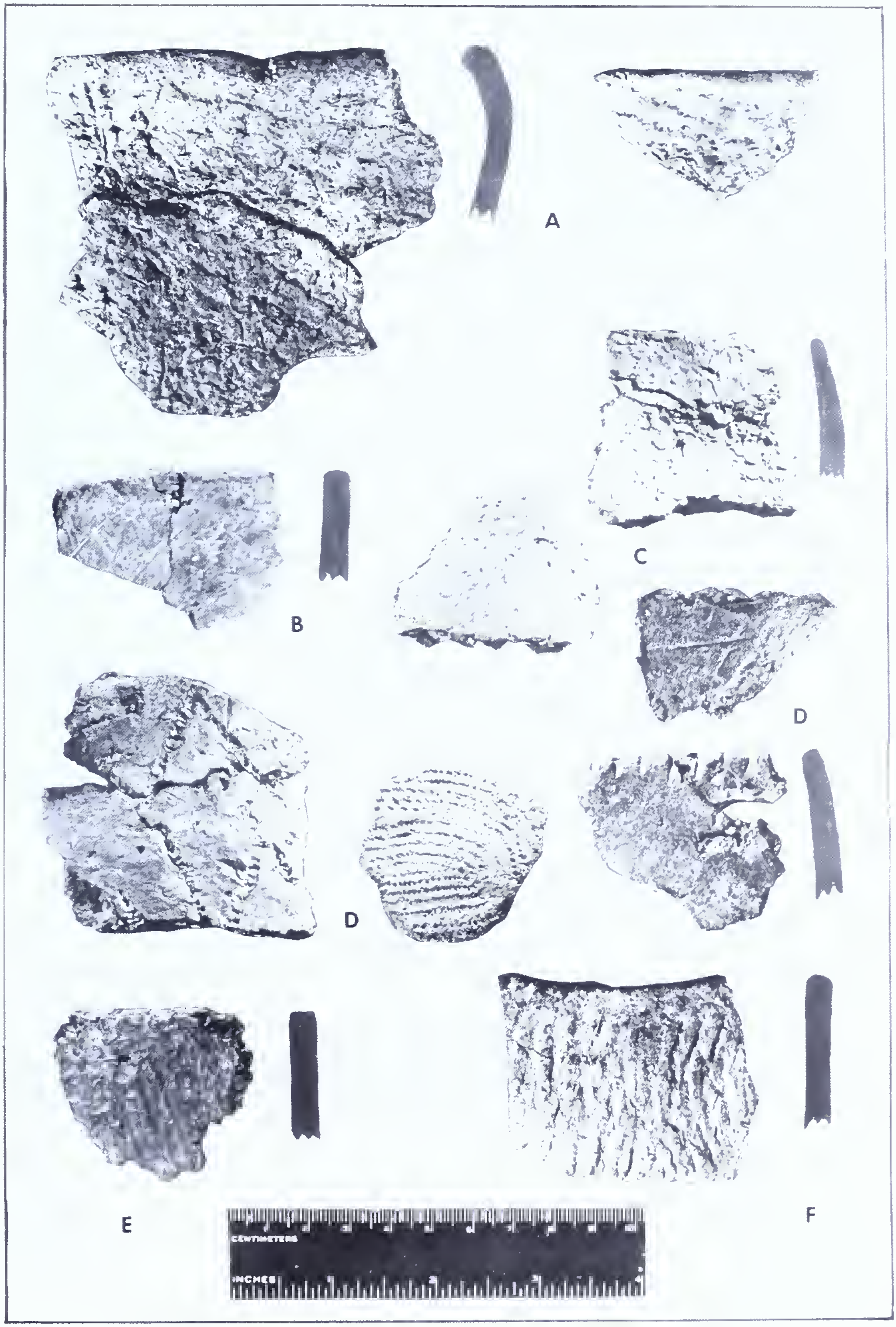
Fig. 48. EARLY SERIES POTTERY TYPES from the Faucett and Brodhead sites: A, (left) Brodhead Net-marked, Feature 12, (right) Brodhead Net-marked, Brodhead site, T. P. 4; B. Wiped; C, Fabric-impressed; D, Dentate-Stamped; E, Vinette 1, Feature 1; F, Exterior Corded/Interior Smoothed, Feature 89.


A
B
C
D
D
E
F
CENTIMETERS
INCHES

form of an oval measuring 30 feet by 25 feet, forms a convincing house pattern. The pattern probably relates to the Bushkill complex. Other postmolds are too randomly dispersed to outline any meaningful pattern.

There were 50 generalized disturbances, each containing at least some items of material culture. These were discolorations and vague disturbances of the subsoil, with the exact boundaries difficult to determine. Generally, the soil was slightly reddened or altered in character by human activities. Disturbances often contain tiny amounts of charcoal as well as cultural remains.

Pottery

In broad terms, pottery excavated at the Faucett site can be subdivided into four groups. The first is the Early Series (Fig. 48). This pottery is generally thick-walled and has rather large pieces of quartz and grit mixed with the paste as temper. With a few exceptions the pottery is undecorated, and surface treatment is mostly cord-marked, net-marked, wiped, and fabric-impressed, or dentate-stamped. Vessel shape is fairly straight-sided with rounded bottoms. Lips are smoothed and rounded with some slightly everted. Rims of the dentate-stamped pottery are notched.

The second is the terminal Owasco Series (Fig. 49 j, k). It is characterized by corded decorative motifs on low incipient collars, often with decorated lips. Corded decorations may occur on the neck and shoulder. Body-surface treatment is cord marking on the exterior with smoothing on the interior. Grit is used as temper and vessels are generally globular in shape with a constricted neck and a thickened rim.

The third group is the Intermediate Series consisting of two pottery types, Bainbridge Linear and Oak Hill Corded (Fig. 50). This group represents the transition between the Owasco and the Tribal Series.

The fourth group is the Tribal Series (Fig. 49 a-d, g-i, l). In this context the term Tribal is used as an adjective to refer to incised pottery. It designates all types of Chance phase pottery as well as other late incised pottery types. The term is not meant to imply a particular ethnohistorical group, but it is used to represent a pottery series in the same way Point Peninsula and Owasco are sometimes used. The term unidentified Tribal designates incised pottery too fragmentary for more precise type identifications. The Tribal Series is recognized by incised geometric plats on low to medium-high col-

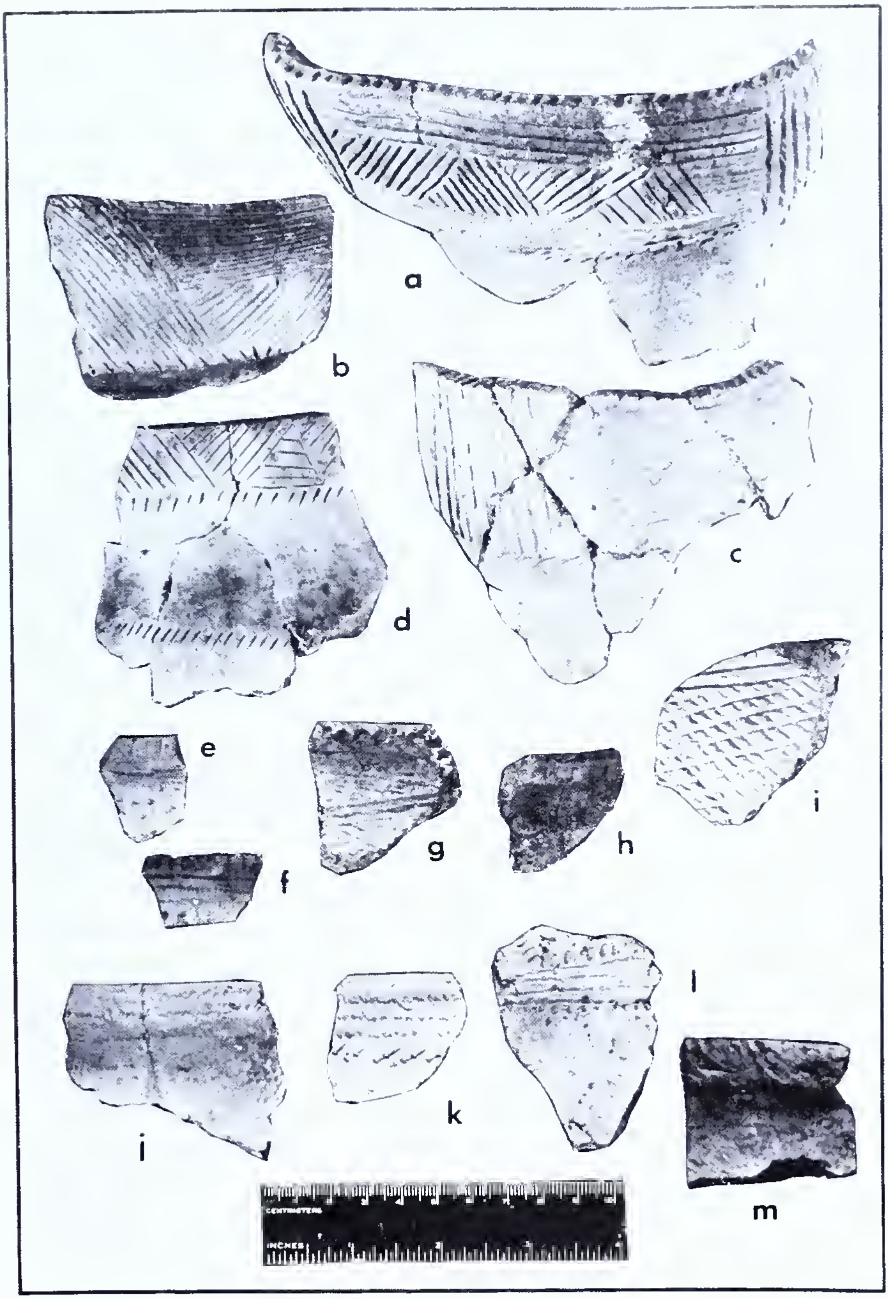


Fig. 49. OWASCO AND TRIBAL SERIES POTTERY TYPES from the Faucett site: A, Durfee Underlined (variant), Feature 52; B, Deowongo Incised, Feature 86; C, Durfee Underlined, Feature 33; D, Deowongo Incised, Feature 44; E, F, Bowman's Brook Stamped, Feature 34; G, I, Overpeck Incised, Feature 28; H, Otstungo Notched, Feature 110; J, Kelso Corded, Feature 107; K, Kelso Corded, Feature 19; L, Bowman's Brook Incised, Feature 9; M, Milo Corded, Feature 117.

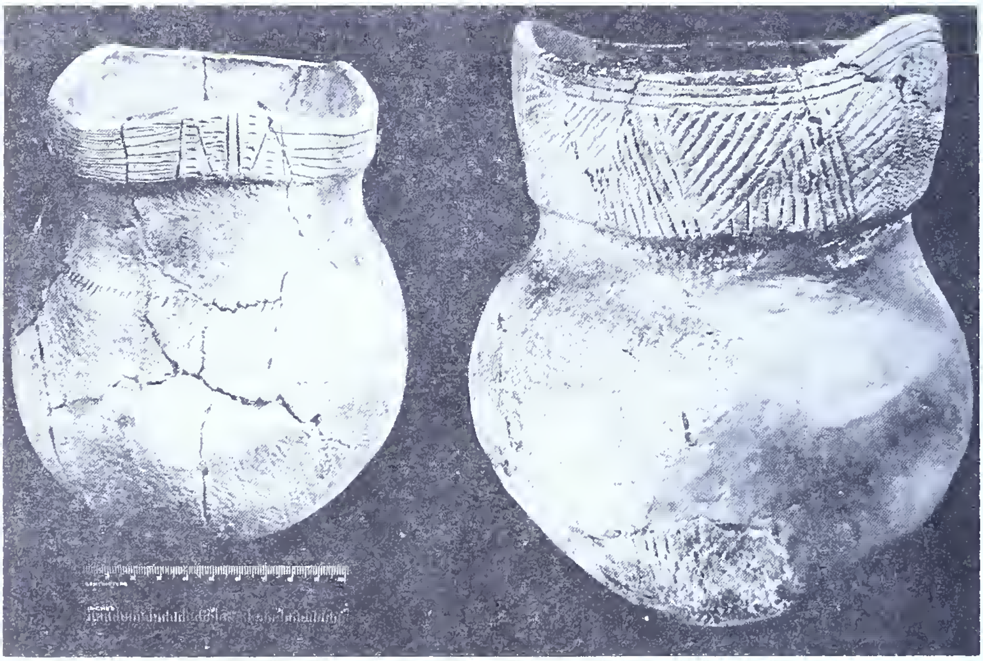


Fig. 50. INTERMEDIATE SERIES POTTERY from the Faucett site: Bainbridge Linear, Feature 50 (left); Oak Hill Corded, Feature 52 (right).

lars. Parallel horizontally incised lines frequently encircle the collar above and below the dominant decorative motif. Vessels are thin-walled with both interior and exterior surfaces generally smooth. Fine grit is used as temper. Body shape is similar to Owasco except for distinctively high and straight collars with two to four castellations.

The second, third, and fourth groups offer no difficulty in description and analysis. Intergrading styles are present, but they are reasonably easy to deal with. The Early Series presents certain difficulties. While there is an adequate number of sherds for most of the types, they are generally small, and it has been impossible to assemble sizable portions of the vessels. This makes it difficult to arrive at certain determinations such as overall surface treatment, vessel shape, and size.

For example, there are differences between the two types of cord-marked pottery. One group, Vinette 1, has interior and exterior cord markings. The Exterior Corded/Interior Smoothed group has exterior cord markings with these markings smoothed over on the interior surface. There are slight differences in paste, color, temper, and thickness, as well as a stratigraphic distinction between these types. It is clear that these are two distinct pottery types. On some indi-

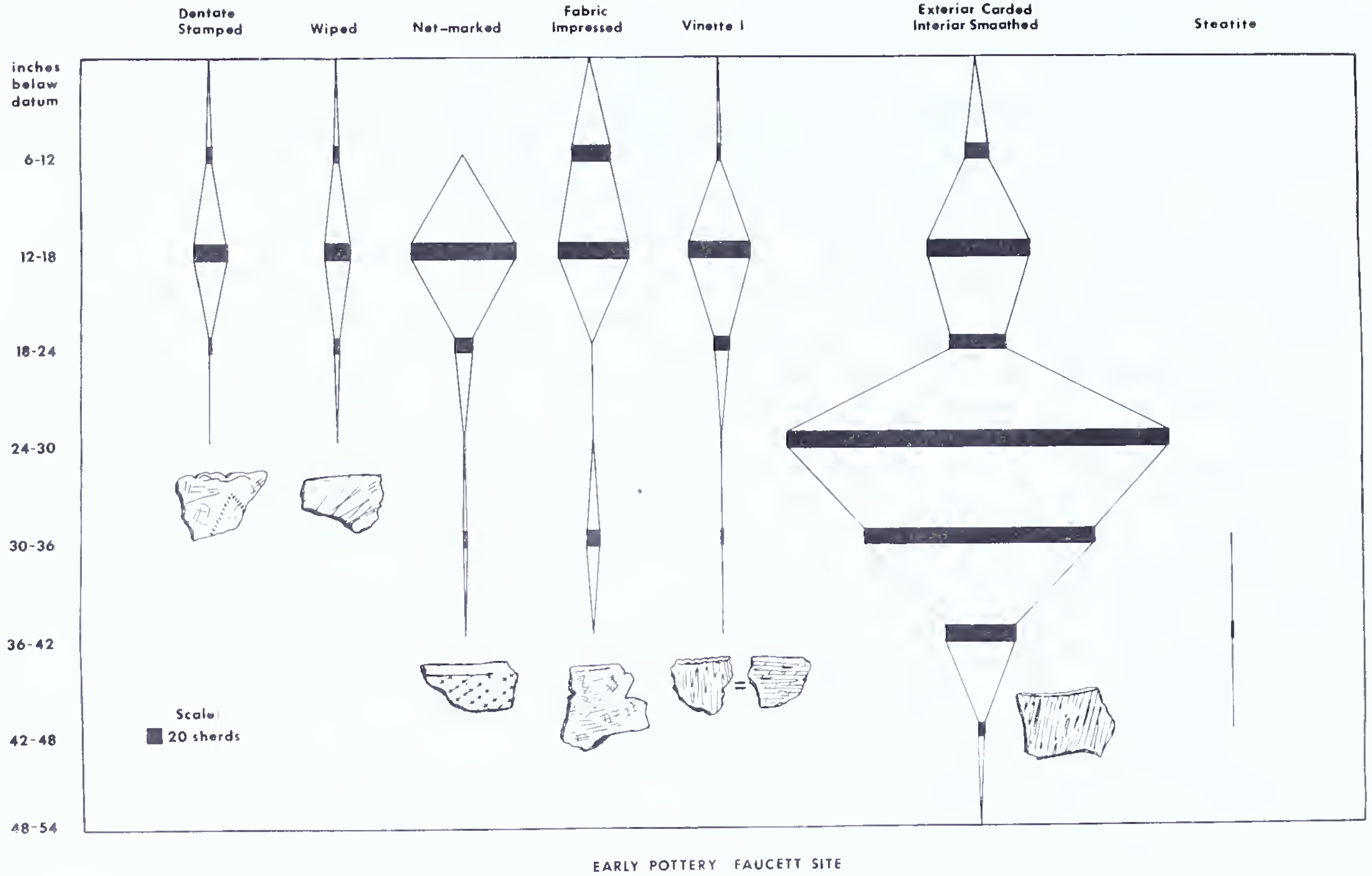


Fig. 51. SERIATION OF THE EARLY SERIES POTTERY TYPES by levels from the Faucett site.

vidual sherds distinctions blur, depending upon which attributes are considered most important. Not every sherd classified as Vinette 1 clearly exhibits the paste, color, temper, thickness, and interior and exterior cord-marked attributes of Vinette 1. However, if most of the basic attributes are present the sherd is considered a member of that type. In the seriation, allowances were made for variation within the type.

In the case of the Brodhead Net-Marked pottery a majority of the sherds are weathered, and in many instances the impressions of the net are nearly obliterated. Net markings remain on the unweathered sherds, but it is not always possible to determine if both surfaces of each sherd have these impressions.

Figure 51 shows vertical distribution for the Early Series pottery. Owasco, Intermediate, and Tribal pottery are not included since they are pit-related types and datum levels are not pertinent.

Five types, Dentate Stamped, Wiped, Brodhead Net-Marked, Fabric-Impressed, and Vinette 1, have their greatest occurrence in the 12- to 18-inch datum level, with relatively minor amounts found outside these levels. These five types are considered to be early Middle Woodland pottery associated with the Bushkill complex.

Exterior Corded/Interior Smoothed pottery is found in six datum levels, and it is most abundant in the 24- to 30-inch level and the next lowest level. This is the earliest pottery at the Faucett site, and it is believed to be associated with either the Meadowood or Orient components.

A single steatite fragment is shown at the 36- to 42-inch datum level, which is the Orient level, and the top of the Perkiomen level. Possibly the sherd belongs to the latter component, although it is impossible to be certain.

Another steatite bowl fragment was found in the tan sand I zone of a square excavated by natural levels. The fragment was very crumbly and it was felt that it might be steatite-tempered pottery. For this reason the fragment was subjected to petrographic analysis by x-ray defraction. Anthony Morse, Geology Department, Franklin and Marshall College, noted the presence of the following minerals in the fragment: talc 60 per cent, anthophyllite (amphibole) 17 per cent, quartz 2 per cent, chlorite 1 per cent, and brown-red cement 20 per cent.

He comments:

> The rather general distribution of talc and amphibole blades, some of which could be single crystals, through the

red-brown cementing material, suggests that these crystals have grown in the cement, and that this is a rock rather than a cast object.

In addition to the two steatite bowl fragments, the following pottery types are recognized:

Early Series	
Exterior Corded/Interior Smoothed	47 rim sherds (Fig. 48 F) 662 body sherds
Brodhead Net-Marked	5 rim sherds (Fig. 48 A) 589 body sherds
Vinette 1	2 rim sherds (Fig. 48 E) 213 body sherds
Fabric-Impressed	1 rim sherd (Fig. 48 C) 152 body sherds
Wiped	3 rim sherds (Fig. 48 B) 116 body sherds
Dentate-Stamped	3 rim sherds (Fig. 48 D) 70 body sherds

	Estimated Number of Whole Vessels Based Upon Rim Sherds		
Owasco			
Kelso Corded	3	9.3%	(Fig. 49 j, k)
Milo Corded	1	3.1%	(Fig. 49 m)
Owasco Toy Pot	1	3.1%	(Fig. 58)
Intermediate			
Oak Hill Corded	3	9.4%	(Fig. 50 right)
Oak Hill Corded (possible)	2	6.3%	
Bainbridge Linear	2	6.3%	(Fig. 50 left)
Bowman's Brook Stamped	2	6.3%	(Fig. 49 e, f)
Tribal			
Deowongo Incised	6	18.7%	(Fig. 49 b, d)
Durfee Underlined	5	15.6%	(Fig. 49 a, c)
Chance Incised	3	9.4%	
Garoga Incised	1	3.1%	
Otstungo Notched	1	3.1%	(Fig. 49 h)
Bowman's Brook Incised	1	3.1%	(Fig. 49 l)
Overpeck Incised	1	3.1%	(Fig. 49 g, i)
Unidentified Tribal	8		

There are also 94 body sherds of a plain ware which resembles Late Woodland Plain ware. (See Fig. 74 A for an illustration of a vessel which is probably of this type.)

PROJECTILE POINTS—126

Except for those points in the miscellaneous category, the projectile point series conforms to 13 diagnostic point types. Ten of these types have been recognized and have been described elsewhere for the

Northeast, while two are new types described for the first time. The specimens easily fall within the accepted range for their respective types and many resemble the holotype. There is considerable uniformity for each of the type groups. For example, the Meadowood points are a stereotype of those found in central New York. Two new types, Macpherson and Eshback, have been recorded at other sites and in surface collections for the Upper Delaware Valley, and these were found in the deeper levels of the Faucett site. The side-notched group is too generalized and the collection too small for refinement.

The projectile points conform to the following types, and measurements are provided for intact specimens when they are considered significant.

Late Woodland (Fig. 52 A)

Madison—7 (Fig. 52 A second row)

Lithic preference	
Flint	4
Chert	2
Jasper	1

Levanna—5 (Fig. 52 A first row)

Lithic preference	
Flint	3
Chert	2

There are also two triangular flint blanks and one jasper blank.

Middle Woodland—Bushkill Complex (Fig. 53 A-C)

Rossville—29 (Fig. 53 A)

Lithic preference	
Flint	16
Argillaceous Shale	10
Chert	2
Argillite	1

	Length (inches)	*Width*	*Thickness*
Range	2.20-1.19	1.07-.64	.42-.23
Average	1.76	.85	.33

(based upon 21 specimens)

Lagoon—14 (Fig. 53 B)

Lithic preference	
Argillite	6
Flint	5
Argillaceous Shale	3

	Length (inches)	*Width*	*Thickness*
Range	2.80-1.31	.95-.68	.45-.28
Average	2.10	.84	.35

(based upon 7 specimens)

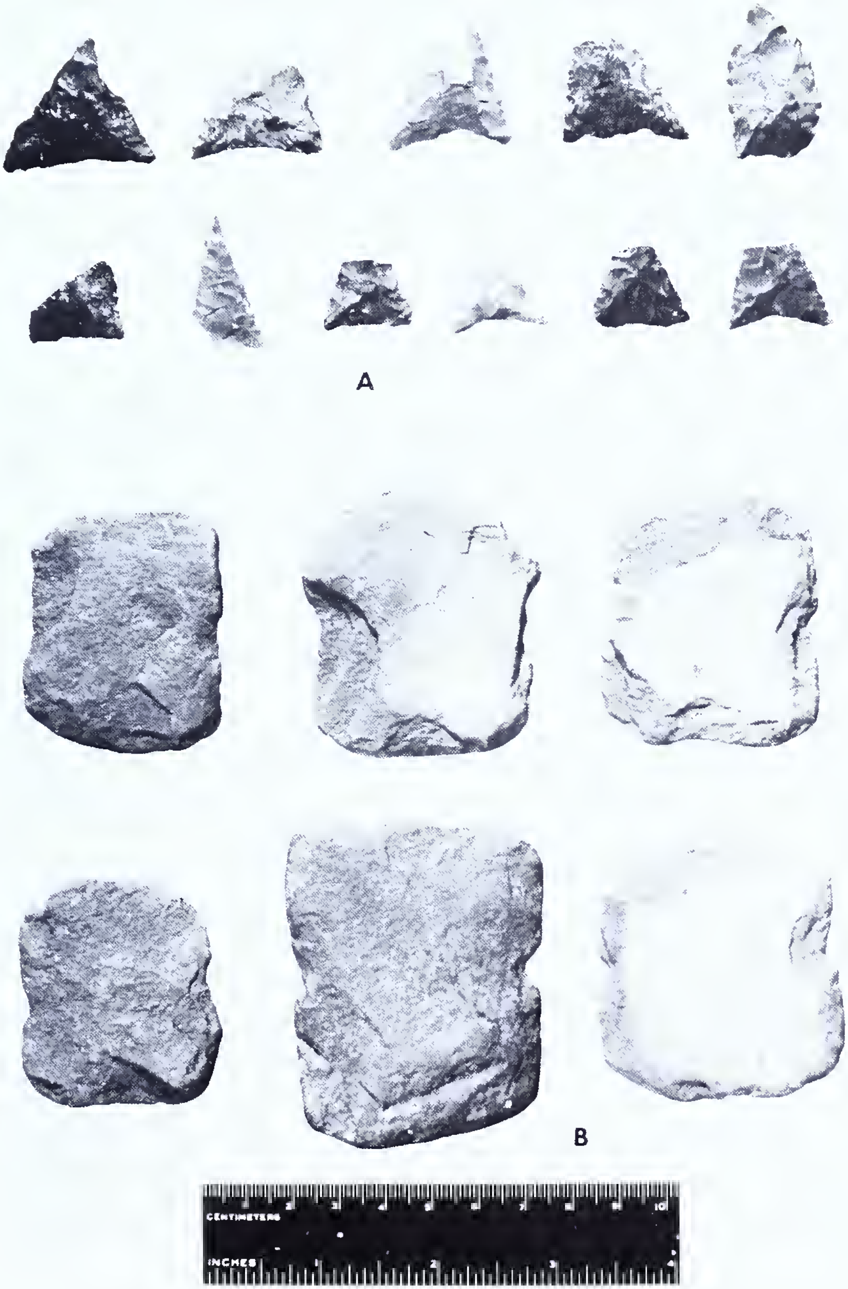


Fig. 52. TRIANGULAR POINTS (A) and notched and trimmed implements (B) from the Faucett site: A, triangular points (top row left to right) Feature 46, flint; Feature 112, flint; Feature 48, chalcedony; Feature 113, flint; Feature 84, flint; (bottom row left to right) 12″-18″, flint, backdirt, chalcedony; bulldozer, flint; Feature 114, jasper; 12″ flint; Feature 9, flint; B, notched and trimmed implements, Feature 117.

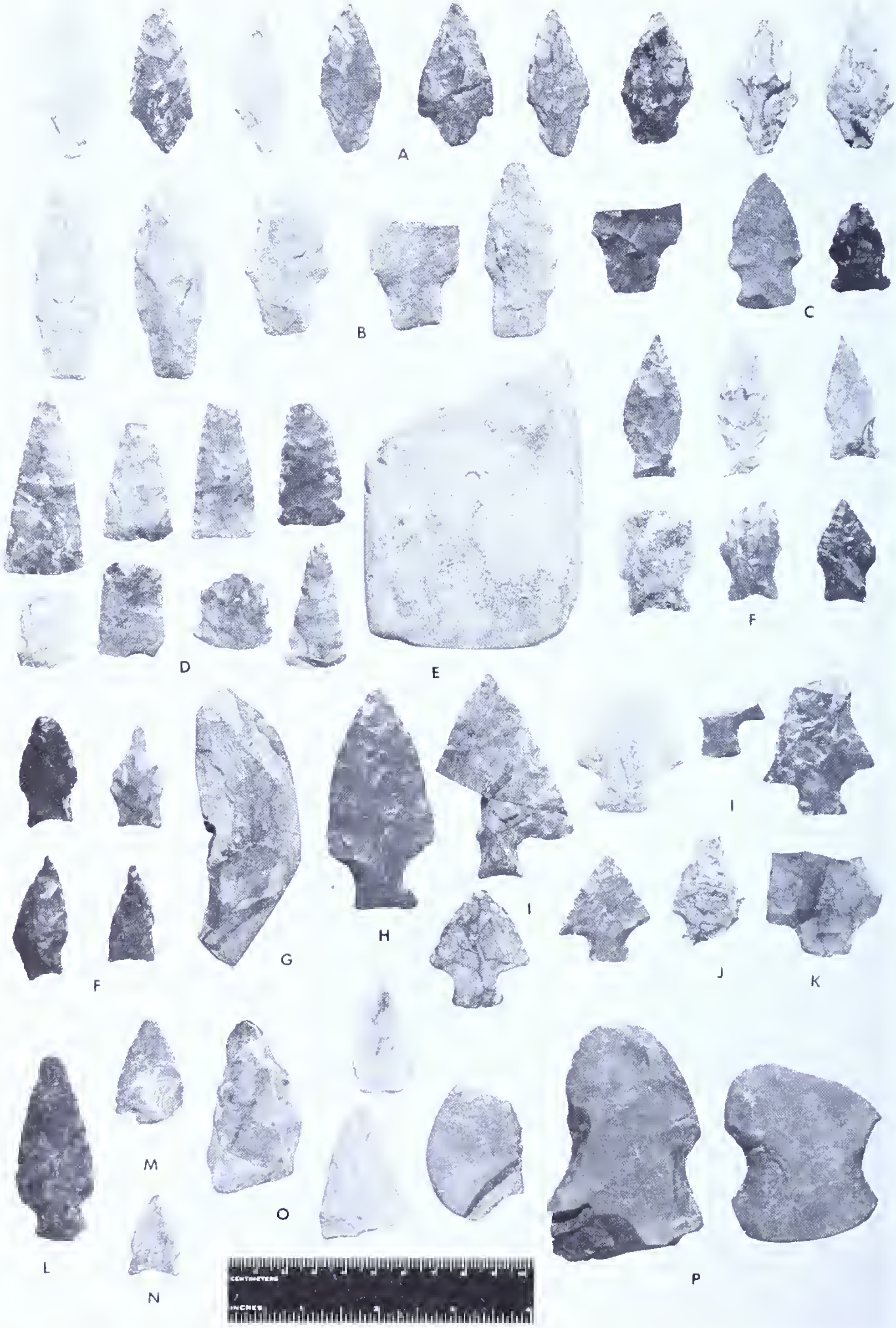


Fig. 53. PROJECTILE POINTS AND OTHER STONE ARTIFACTS from the Faucett site: A, Rossville points (left to right) 6″-12″, shale; 12″, flint; 12″-18″, argillite; 6″-12″, flint; 12″, flint; 12″-18″, shale; 12″-18″, flint; 12″-18″, shale;

Side-Notched—5 (Fig. 53 C)

Lithic preference	
Argillite	2
Flint	2
Chert	1

	Length (inches)	*Width*	*Thickness*
Range	1.78-1.19	1.04-.79	.38-.20
Average	1.51	.93	.29

(based upon 3 specimens)

These side-notched points are believed to be a generalized Middle Woodland point type. They are associated with the Rossville and Lagoon points of the Bushkill complex.

Early Woodland

Meadowood—17 (Fig. 53 D)

Lithic preference	
Onondaga Chert	17

	Length (inches)	*Width*	*Thickness*
Range	2.50-1.68	1.05-.82	.28-.20
Average	1.99	.92	.23

(based upon 4 specimens)

Early Woodland—Fishtail Tradition

Orient—24 (Fig. 53 F)

Lithic preference	
Jasper	14
Flint	4
Chert	4

12″, shale; B, Lagoon points (left to right) 12″, argillite; 12″, argillite; 12″, argillite; bulldozer, argillite; topsoil, argillite; backdirt, flint; C, side-notched points (left to right) 12″, argillite; 12″-18″, flint; D, Meadowood points (top left to right) 42″-48″, Onondaga chert; 18″-24″, Onondaga chert; 18″-24″, Onondaga chert; 30″-36″, Onondaga chert; (bottom left to right) 3″-12″, Onondaga chert; 24″-30″, Onondaga chert; 24″-30″, Onondaga chert; 18″-24″, Onondaga chert; E, gorget, 36″-42″, stiltstone; F, Orient points (top left to right) 24″-30″, chert; 9″-18″, jasper; 30″-36″, argillite; (bottom left to right) Feature 113, chert; 30″-36″, jasper; 9″-18″, Feature 89, chert; (top, left to right) 24″-30″, flint; 30″-36″, jasper; (bottom) 9″-18″, jasper; 30″-36″, jasper; G, spear thrower weight, 30″-36″; H, Perkiomen broad spear (variant), 36″-39″, jasper; I, Perkiomen broad spears (top left to right) 36″-42″, jasper; 42″-48″, jasper; 42″-48″, jasper; 42″-48″, argillaceous shale; 42″-48″, jasper; 43″, jasper; (bottom left to right), 48″-54″, argillite; 36″-42″, jasper; J, Susquehanna drill, 18″-24″, rhyolite; K, Lehigh broad spear, dark red disturbance I, argillite; L, Macpherson point, 48″-54″, flint; M, Eshback point, 67″, chert; N, Brewerton Eared-notched point, 79″, argillite; O, Delaware Valley Archaic complex knives/scrapers (left) 78″, argillaceous shale; (upper right) 72″-78″, argillaceous shale; (lower right) 54″-60″, argillaceous shale; P, netsinkers (left to right) 54″-60″; 55″, possible notched spear thrower weight; 54″-60″.

Argillaceous Shale	1
Quartzite	1

	Length (inches)	*Width*	*Thickness*
Range	2.00-1.35	.78-.63	.38-.26
Average	1.64	.71	.31

(based upon 7 specimens)

Late Archaic—Broadspear Tradition

Perkiomen—7 (Fig. 53 I)

Lithic preference

Jasper	6
Argillaceous Shale	1

An apparently unfinished jasper specimen was found in the Perkiomen level (Fig. 53 H). It resembles either an oversized Orient, a variant Perkiomen, or a hybrid intergrade between these two types. Blade edges are convex, shoulders are rounded, and it is thicker than most examples of either type. The piece measures 2.92 inches long by 1.42 inches wide.

Lehigh—1 (Fig. 53 K)

Lithic preference

Argillaceous Shale	1

Susquehanna—1 (Fig. 53 J)

Lithic preference

Rhyolite	1

This point has been reworked and used as a drill.

Delaware Valley Archaic Complex

Macpherson—1 (Fig. 53 L)

Lithic preference

Flint	1

Laurentian Tradition

Brewerton Eared-Notched—1 (Fig. 53 N)

Lithic preference

Argillaceous Shale	1

Other Archaic

Eshback—1 (Fig. 53 M)

Lithic preference

Chert	1

The Macpherson point from the 48- to 54-inch level is a roughly chipped, broadly side-notched point with a thick stem. It is a new type and it is identical to three points excavated from Level IV at the Brodhead-Heller site and a group of 53 surface-collected points from the Macpherson Collection (Fig. 117 A). The Eshback point is also a new type. It resembles eight basally-notched points found at the

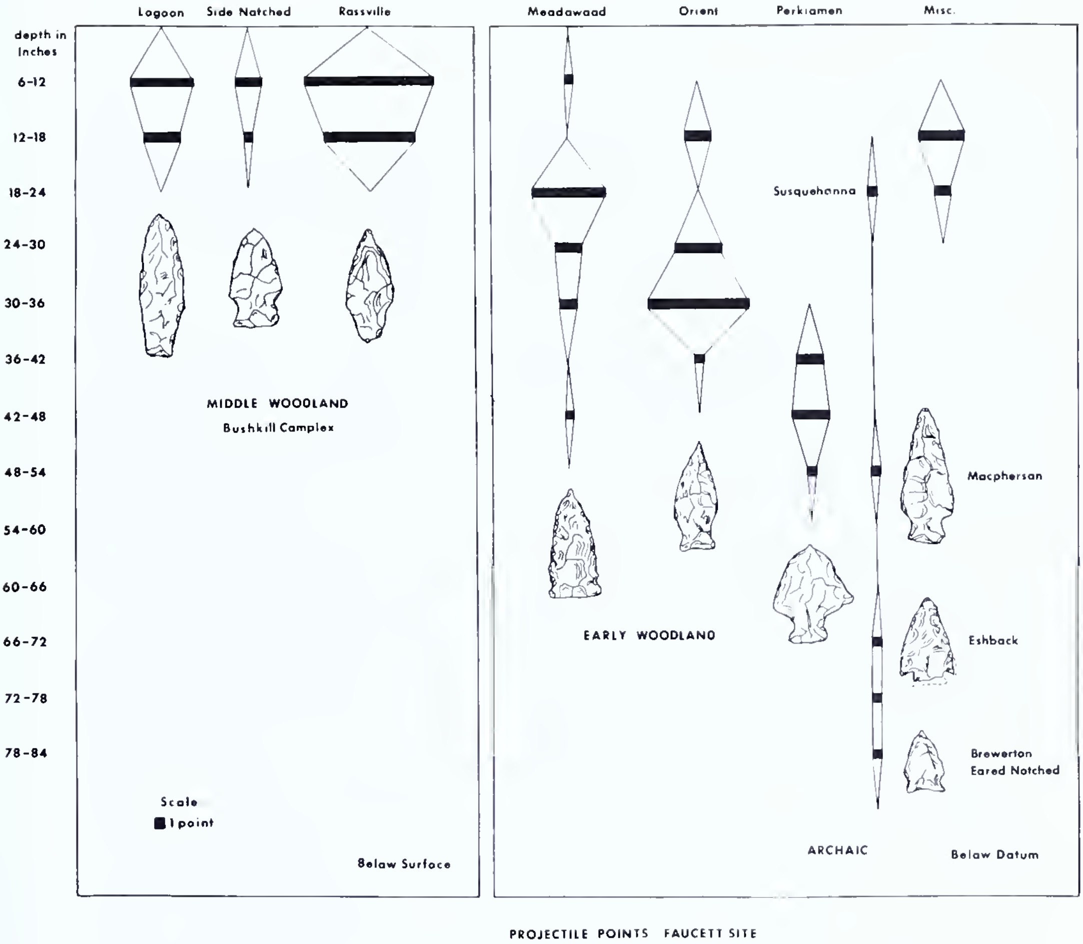


Fig. 54. SERIATION OF PROJECTILE POINT TYPES from the Faucett site.

Lee's Terrace site as well as a group from the Macpherson Collection (Fig. 116 E). This point is made of gray chert and was found at the 67-inch datum level. In the deepest datum levels (72 to 78 inches and 78 to 84 inches), four probable artifacts of argillaceous shale were located (Fig. 53 O). These deeply weathered specimens resemble the trianguloid knives from the Egypt Mills site (Fig. 69 J), and they are considered to be a trait of the Delaware Valley Archaic complex. Possibly one is a fragment of a projectile point, but because of the deteriorated condition of the material it is not possible to be certain that this is the case. The other fragments might be knife/scraper implements, but again there is uncertainty. The Brewerton point of argillaceous shale found at 79 inches below datum falls within the range of the smaller points of this type. It measures 1.10 inches in length by .67 inch in width and .20 inch in thickness. The point has a basic triangular shape, excurvate blade edges, very shallow side notches, and a concave base.

MISCELLANEOUS

Included here are several types, broken fragments, and aberrant forms. Some are out of context as to level or feature association. They are not included on the graph with the major types, but, where possible, specimens in this group are shown under the "Miscellaneous" heading.

Type		*Level*
Possible Brewerton Side-Notched (unfinished)	1	topsoil
Jack's Reef Corner-Notched	1	12 inches
Possible Meadowood	2	18 to 24 inches
Possible Orient	4	12 to 18 inches
Narrow Blade, Stemless	1	12 inches
Small Straight Stem	2	topsoil
Stemmed Blank (unfinished)	1	Feature 4 18 to 24 inches
Stemmed Broad Blade	1	12 inches

The projectile point seriation figure shows vertical distribution for the major point types and their respective components (Fig. 54). Lithic preference is illustrated on Table 7 with all spalls and chipped stone artifacts included in the totals.

Three Middle Woodland types, Lagoon, Rossville, and side-notched, are most popular in the 6- to 12- and the 12- to 18-inch levels. Argillite, the preferred material for Lagoon points, has a high percentage, 75.3 per cent and 76.5 per cent, of occurrence in these two levels, and it is also popular in the next deeper level. Flint, the preferred material for Rossville points, is not abundant, but ranks second in frequency to argillite in those levels. These three point types and lithic materials are diagnostic for the Bushkill complex.

Meadowood points occur in five levels, with the largest number found at the 18- to 24-inch datum level. Three were from the next deepest level, and two were found in the 30- to 36-inch datum level. A single Meadowood blade was associated with a gorget at the 42- to 48-inch datum level. These were found in a deeply buried feature rather than an occupational zone for this component. Onondaga chert was used for the production of all Meadowood points, but this preference is not expressed on Table 7. Spalls of this distinctive chert are rare at the Faucett site.

Orient points are most abundant at the 30- to 36-inch datum level and the immediately superior level. The somewhat uneven distribution of these points is due to the irregularity of the large rock-filled hearth, Feature 89 (Fig. 60), where seven points of this type were found.

Table 7. Lithic Preference by Levels.

Component	Depth	Flint		Jasper		Shale/ Argillaceous Shale		Rhyolite		Argillite		Chert		Others		Total
		No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	
Bushkill	6″-12″	32	11.5	9	3.3	12	4.4	1	0.4	210	75.3	12	4.4	2	0.7	279
Bushkill	12″-18″	285	11.1	115	4.5	76	2.9	19	0.7	1962	76.5	85	3.4	22	0.9	2564
Bushkill	18″-24″	24	11.8	51	25.1	8	3.9	2	1.0	110	53.8	7	3.4	2	1.0	204
Meadowood	24″-30″	34	12.9	168	63.9	6	2.3	3	1.1	35	13.3	15	5.7	2	0.8	263
Orient	30″-36″	14	6.4	130	59.2	12	5.4	1	0.5	53	24.1	9	3.9	1	0.5	220
Orient	36″-42″	6	8.0	47	62.7	6	8.0	0	0.0	12	16.0	3	4.0	1	1.3	75
Perkiomen	42″-48″	13	10.8	61	50.5	11	9.1	2	1.6	25	20.7	1	0.8	8	6.6	121
Perkiomen	48″-54″	2	7.7	6	23.2	13	50.0	0	0.0	4	15.2	0	0.0	1	3.9	26
Sterile	54″-60″	1	20.0	0	0.0	3	60.0	0	0.0	1	20.0	0	0.0	0	0.0	5
Sterile	60″-66″	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0
D.V.A.C.	66″-72″	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	2	100.0	0	0.0	2
D.V.A.C.	72″-78″	0	0.0	0	0.0	1	33.3	0	0.0	0	0.0	1	33.3	1	33.3	3
D.V.A.C.	78″-84″	0	0.0	0	0.0	3	60.0	0	0.0	1	20.0	0	0.0	1	20.0	5
D.V.A.C.	132″-138″	0	0.0	0	0.0	1	50.0	0	0.0	0	0.0	0	0.0	1	50.0	2
	Total	411	10.8	587	15.6	152	4.0	28	0.6	2413	64.5	135	3.5	42	1.0	3728

Jasper has its greatest popularity in the four datum levels between 24 and 48 inches, and this expresses the high frequency for the use of jasper in the manufacture of both Orient and Perkiomen points. Both of these components at this site, as well as other sites, show a strong cultural preference for jasper.

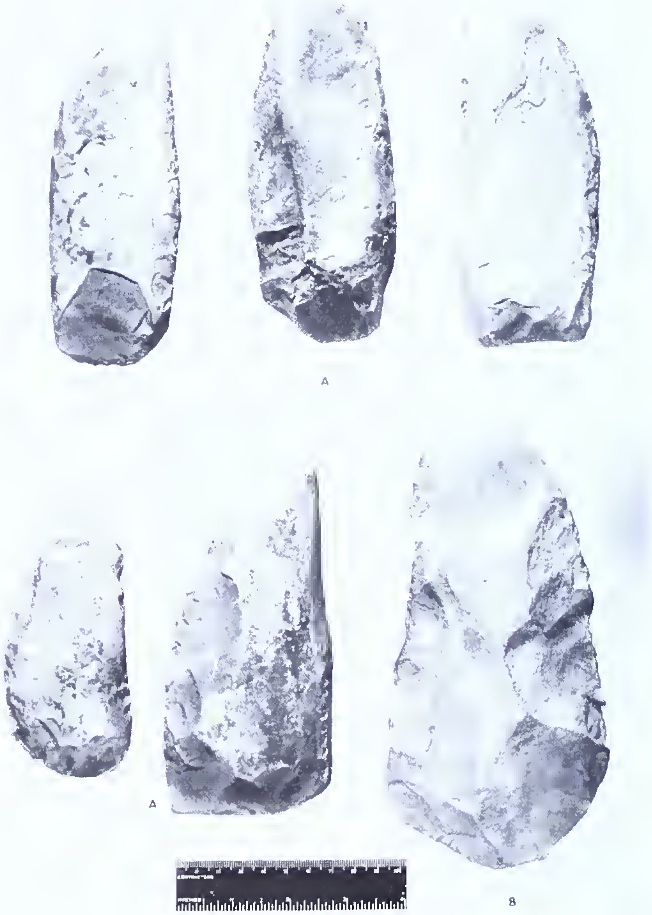


Fig. 55. CACHE OF FIVE ADZE BLANKS and an additional adze blank from the Faucett site: A, adze blanks from cache, Feature 124, 48″, siltstone; B, adze blank, 48″-54″, siltstone.

Perkiomen points are most popular at the 42- to 48-inch datum level. One point was found in the next deeper level and three were from the 36- to 42-inch datum level. A single Susquehanna broadspear, which was reworked into a drill, was found in the 18- to 24-inch datum level. This drill is out of place in that level, although it is possible that the drill had been utilized by peoples of a later culture.

In the deepest levels a Macpherson point, four probable trianguloid knife or scraper implements of argillaceous shale, and a bipitted muller, are postulated traits of the Delaware Valley Archaic complex, although the non-diagnostic items may be associated with other possible early components. It is speculated that the Brewerton and the Eshback points each characterize separate components and that the former is a cross-cultural trait or intrusion occurring with a component of the Delaware Valley Archaic complex. Little can be inferred about the lithic preference in these deep levels except that there was a tendency to use local shales and argillaceous shales.

Miscellaneous points and fragments are found only in the 12- to 18- and 18- to 24-inch datum levels. No significance is attached to this observation.

OTHER STONE TOOLS

Three categories of stone tool types are used to describe and classify the stone artifacts. They are Chipped, Pecked and Ground, and Altered by Usage.

Chipped

Projectile Points (including fragments)	163	
Blanks and Knives	30	(Fig. 53 O)
Drill	1	(Fig. 53 J)
Notched Spearthrower Weight	1	(Fig. 53 G)
Possible Notched Spearthrower Weight	1	(Fig. 53 P)
Rough Unfinished Forms	6	
Unfinished Adze Blanks	10	(Fig. 55 A, B)
Hoes	5	(Fig. 57 D)
Notched and Trimmed Implements	21	(Figs. 52 B; 57 E)
Heavy Choppers	2	
Teshoas	18	
Netsinkers	12	(Fig. 56 D)
Bifaces (large)	4	
Spalls: Argillite 2,413, Jasper 587, Flint 411, Shale/Argillaceous Shale 152, Chert 135, Rhyolite 28, Others 42		
Total or 75.1% of the sample	274	

Two groups of the above chipped stone tools merit additional comment and consideration.

A cache of five adze blank forms was found in Feature 124 in the Perkiomen level, 48 inches below datum (Fig. 55 A). These pieces range from five to six inches long, from about two to nearly three inches wide, and from .65 to 1.2 inches thick. They are made of a hard, dense siltstone. Each has been chipped on at least one long edge and on the bit. Four show some evidence of having been pecked. None of the specimens has been worked along the entire perimeter.

Apparently, these partly worked blank forms were intended to be made into finished adzes by chipping, pecking, and grinding. They are thought to have been cached by Indians of either the Perkiomen or the Orient culture for storage until a propitious time arrived for completing the artifact. Because of the associations with occupational levels at this site as well as the occurrence of these forms elsewhere in the Tocks Island Reservoir (Brodhead-Heller, Zimmermann, and Miller Field sites), it is clear that adzes are a trait for both Perkiomen and Orient.

The largest unfinished blank was also the deepest of the adze forms (Fig. 55 B). This example was found in the 48- to 54-inch level, which is the bottom of the Perkiomen level in one area. At the same level in a square 60 feet distant, a Macpherson point was found. A larger and slightly different blank form may belong to the Delaware Valley Archaic complex. Still another blank of the same general character was found in the 12- to 18-inch level (Fig. 56 E). It differs in that it is made from sandstone rather than shale and it is pitted. There are two pits on one surface and one on the opposite side.

The notched and trimmed rectanguloid implements are made of metamorphosed siltstone (Fig. 52 B). The largest is 2.75 inches long by 2.15 inches wide while the smallest one is 1.97 inches long by 1.70 inches wide. All examples are thin—they measure less than .50 of an inch thick. These tools were shaped by percussion flaking around the entire edge, and shallow notches are present at the midpoint on the two long sides. They are well worn from extensive use. A first impression is that these artifacts are small hoes or netsinkers. However, their small size seems to preclude the possibility that they were used as hoes, and the worn edges are not likely to occur from use as netsinkers. One possible explanation is that they were employed as scraping tools and the notches served as hafting points.

Ground and Pecked

Gorgets	5	(Figs. 53 E; 56 A)
Possible Gorget (fragment)	1	(Fig. 56 B)
Pestle	1	(Fig. 57 G)
Celts	5	(Fig. 57 H)
Bola Stones	3	(Fig. 56 C)
Total	15	

or 4.3% of the sample

There are five broken gorgets. One is a broad (three inches wide), thin fragment probably of a rectanguloid gorget which has been drilled from one side. The others are also of a subrectangular shape converging toward a more narrow end. One fragment is from a gorget having two definite holes, and the other fragments are too small to determine the number of holes that may have been present. Another specimen has an incompletely drilled hole, and yet another fragment has a worn semicircular section at the break. These gorgets are made of fine-grained siltstone and slate. A fragment may be of an unfinished gorget, but it is impossible to be certain.

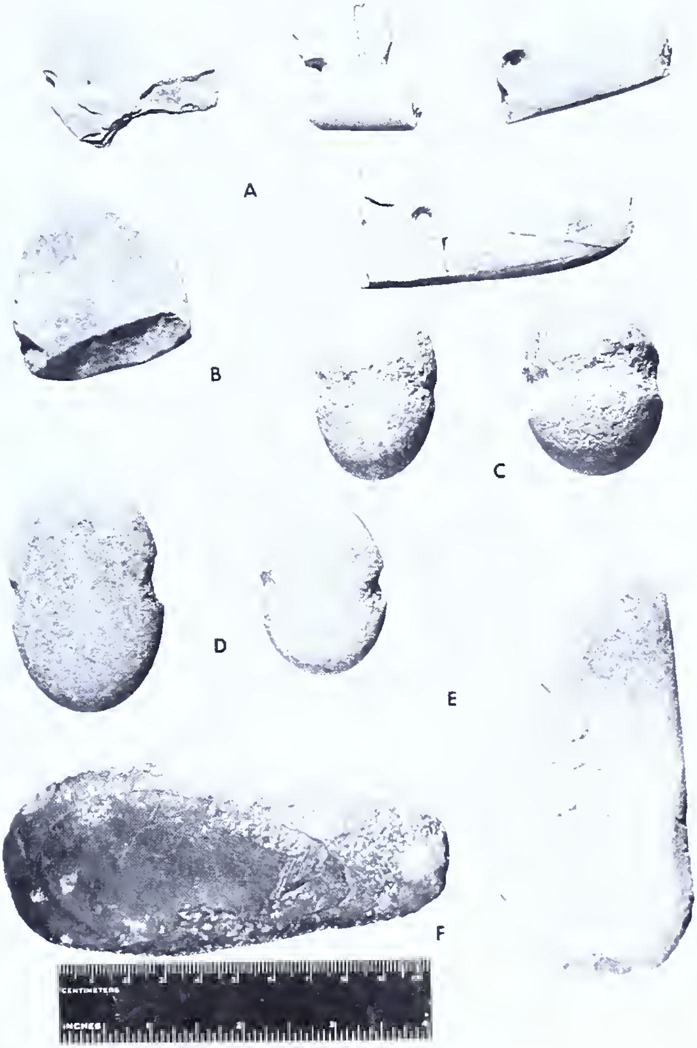


Fig. 56. ARTIFACTS OF THE BUSHKILL COMPLEX from the Faucett site: A, gorgets; B, unfinished gorget; C, bola stones; D, netsinkers; E, bipitted adze blank; F, celt.

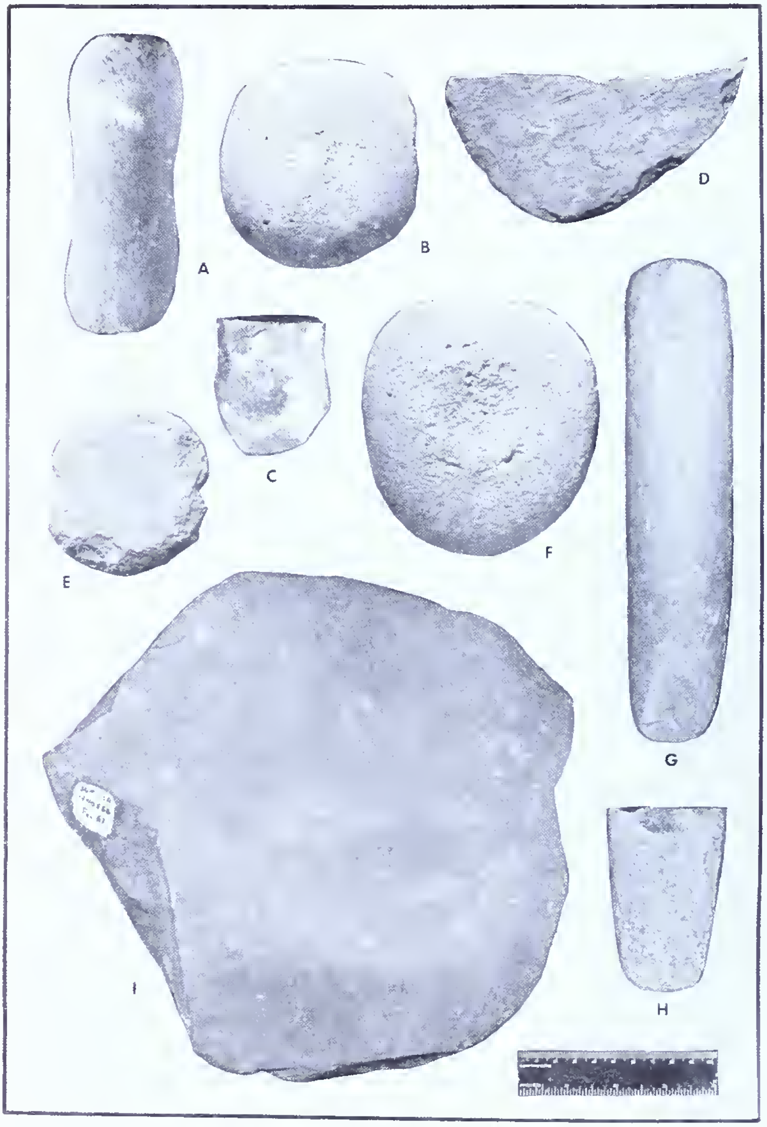


Fig. 57. ARTIFACTS OF THE BUSHKILL AND LATE WOODLAND components from the Faucett site: A, pestle-like implement; B, pitted muller; C, unfinished adze; D, hoe; E, notched and trimmed implement; F, bipitted muller; G, pestle; H, celt; I, grinding stone.

Altered by Usage

Mullers		33 (Fig. 57 B, F)
Plain Mullers	8	
Mullers also used as hammers or pounders	10	
Pitted Mullers	2	
Pitted Mullers also used as hammers or pounders	13	
Grinding Stones		17 (Fig. 57 I)
Smooth Stones		6

Hammerstones	5
Pitted Stones	3
Anvil Stones	5
Possible Sinew Stone	1
Natural elongated pestle-like implement with battered ends	4
Strike-a-light	1
Total	75
or 20.6% of the sample	

The four elongated pestle-like pieces are thought to be natural stones and not unfinished pestles. The blunt end is scarred from battering or pounding.

Limonite pseudomorphs with a cubic structure occur in shale. The strike-a-light is a worn shale fragment having limonite, which has decomposed from pyrite, attached to it. Originally the pyrite was a bright cube or multiple cubes.

ANTLER COMB (Fig. 58)

A small (1.8 inches long by 1 inch wide) antler comb was found in Feature 9. The teeth are missing as a result of the ravages of time, but an oval human face is clearly visible on both sides. The eyes and mouth are formed by small semiconical drilled depressions. In the same pit were two rim sherds (probably from a single vessel) of Bowman's Brook Incised pottery (Fig. 49 l). This pottery type is found in coastal New York (and elsewhere) and occasionally exhibits face effigies. Probably this trait was carried over to other objects such as combs. Trade and/or travel between tribes from the Upper Delaware and those from coastal New York are indicated.

ASSOCIATIONS

The Owasco and Tribal components were found largely in aboriginal pits. The Bushkill component was located within a 12-inch zone beginning near the top of the subsoil and extending downward for that distance. Meadowood, Orient, Perkiomen, and the several Archaic components were found in the deeper levels of the excavation. There was a general diminution of cultural remains in the lower occupational zones.

DELAWARE VALLEY ARCHAIC COMPLEX

For the deepest levels, cultural materials associated with diagnostic point types are restricted to a bipitted muller; a projectile point; and seven worked pieces of argillaceous shale, argillite, and chert, one of

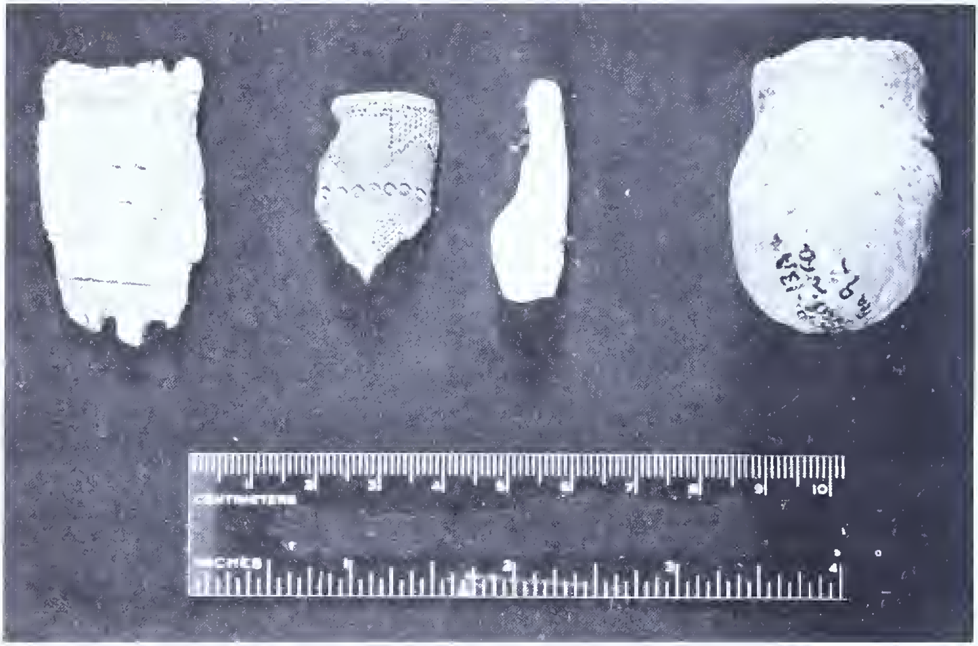


Fig. 58. MISCELLANEOUS ARTIFACTS FROM LATE WOODLAND COMPONENTS from the Faucett site: antler comb, Feature 9; pipe, *pointillé* style, Feature 113; shell bead, Feature 119; Owasco toy pot, Feature 92.

which may be a broken projectile point. The others may have been utilized as cutting or scraping implements, but the deeply weathered condition of the lithic material makes it impossible to determine if they were used as tools. These few pieces are the only basis for postulating the presence of a component of the Delaware Valley Archaic complex at the Faucett site. A Brewerton Eared-Notched point and a bipitted muller, showing signs of wear along the perimeter from use as a hammerstone, were found in the same level (79 and 81 inches below datum respectively) of two adjacent squares.

In the same square (N120E20) and level (72 to 78 inches below Datum 1) as the Brewerton point, scattered fragments of charcoal were collected. This charcoal was from an occupational zone and not from a hearth. It was assayed at 3230 B.C. ± 200 years (Y-2479), and this is considered a reliable date for a phase of the Delaware Valley Archaic complex. It is hypothesized that the Brewerton point represents a possible cross-cultural trait or intrusion and that it is not an intrinsic trait of this complex. Lithic material found in this level offers a slight hint that the diagnostic Lackawaxen Stemmed type might be present if a larger horizontal area could have been excavated at this level.

Other Archaic traits are recognized on the basis of single diagnostic point types. An Eshback point from the 60- to 66-inch datum level and a Macpherson point in the 42- to 48-inch datum level represent Late Archaic cultural manifestations.

BROADSPEAR TRADITION—PERKIOMEN COMPONENT

Broadspears consist of seven Perkiomen points, a Lehigh, and a Susquehanna point reworked into a drill. With one exception, the seven Perkiomen points were closely associated and were found in four adjacent squares. In these same squares and levels (36 to 42, 42 to 48, and 48 to 54 inches below datum) were two netsinkers and a pitted muller. The next lower level of the same squares yielded three netsinkers (Fig. 53 P). One of the three (Fig. 53 P center) is battered and chipped along the perimeter. It may be that this specimen is a broken and unfinished notched spearthrower weight, although its fragmentary condition makes it impossible to determine its original form. A single Perkiomen point was beneath Feature 89, the large rock-filled hearth, at the 36- to 42-inch level below datum. Large heavy netsinkers and mullers are clearly a part of the Perkiomen component. Jasper chips, although not abundant, had a relatively high percentage of occurrence in the Perkiomen component, and this reflects the preference to fashion these points from jasper.

An adze blank, a netsinker, and a muller came from the same level of three adjacent squares. Three netsinkers and the possible notched spearthrower weight were in the next lower datum level, 54 to 60. These early netsinkers are heavier and thicker than the similar artifact of later components. In the southeastern part of the site plot a cache of five chipped adze blanks was found in Feature 124 at the 48-inch datum level. Elsewhere at the site this is the Perkiomen level. Although no points of this type were found here, the absence may be due to the restricted size (three squares) of the deeper excavation in that area. This section yielded a heavy Orient occupation at the 30- to 36-inch datum level. There is some uncertainty as to whether the cache is more deeply buried from the Orient level or whether it represents the Perkiomen component. The cache was from the same square as a rhyolite drill which had been reworked from a Susquehanna broadspear. The drill came from the 18- to 24-inch datum level.

Two small soapstone bowl fragments, probably from the same vessel, were unearthed. One occurred in the tan sand Zone 1 of a square dug by natural levels, and the other in the 36- to 42-inch datum level.

Because this natural zone varied between 32 and 36 inches in thickness, it is impossible to key the specific location of the sherd to a six-inch excavation level. This zone includes the bottom of the Bushkill component, Meadowood, Orient, and possibly the top of the Perkiomen levels. The base of a Lehigh point of argillite and a netsinker were found in the next deepest natural zone. This was a dark red zone 11 to 15 inches thick and included the Perkiomen level. Diagnostic Perkiomen points were found in the 36- to 42-, 42- to 48-, and 48- to 54-inch datum levels in squares adjacent to these two natural zones.

The occurrence of only two fragments of soapstone in the upper portion of the Perkiomen level is slender evidence for considering stone bowls as a trait of that component. The inference is that the association is valid for either Perkiomen or Orient, but it is more likely the former. There is no other obvious explanation for the presence of the pieces in these levels.

Netsinkers, pitted mullers, chipped adzes, and a preference for jasper in the manufacture of projectile points are obviously traits of the Perkiomen component at the Faucett site.

Associated with the Perkiomen component was Feature 99 at 57 inches below Datum 1 in Square N110E10. This hearth feature was densely packed with charcoal and produced a date of 1500 B.C. ± 120 years (Y-2478), which is considered to be a reliable date for the Perkiomen component.

EARLY WOODLAND—ORIENT COMPONENT

With one exception, the Orient occupation was found in three areas. A single point of this type was found in Feature 113 in the extreme southwest corner of the site. Had it been possible to conduct more extensive excavations between the hearth and the unit of three deeply excavated squares in the southwest portion of the site plot, it is likely that these two areas would have proved to be a continuous Orient occupation. The largest concentration of Orient points occurred in the unit of three deeply excavated squares. Twelve points were found in two squares, with 10 points in the 30- to 36-inch datum level and one point in each of the immediately superior and inferior levels. A notched spearthrower weight was found in the same level with the group of 10 points.

Eight Orient points were located in Feature 89 (Fig. 60). Three remaining points came from three contiguous squares of the deeply excavated unit along the northern perimeter of the site plot. In adjacent squares and in similar levels a netsinker, a muller, and a hammerstone were found.

Hearth 123 (24 to 30 inches below Datum 1) is located in the deep excavation in the northern part of the site, although it is not shown on the site plan. This feature yielded two heavy rounded netsinkers and two jasper spalls. An Orient point was found in the same square and level as the hearth.

Areas where there are more than 10 chips of the preferred lithic material for the particular component are designated workshops. Two workshops were present for the Orient component. Over 180 jasper spalls were concentrated in two levels of two squares of the deeply excavated unit in the southeastern part of the plot which yielded the 12 points. Traits for the Orient component include the Orient Fishtail projectile point, a notched spearthrower weight, netsinkers, hammerstones, and possibly adze blanks.

There is a definite preference for jasper in the production of the

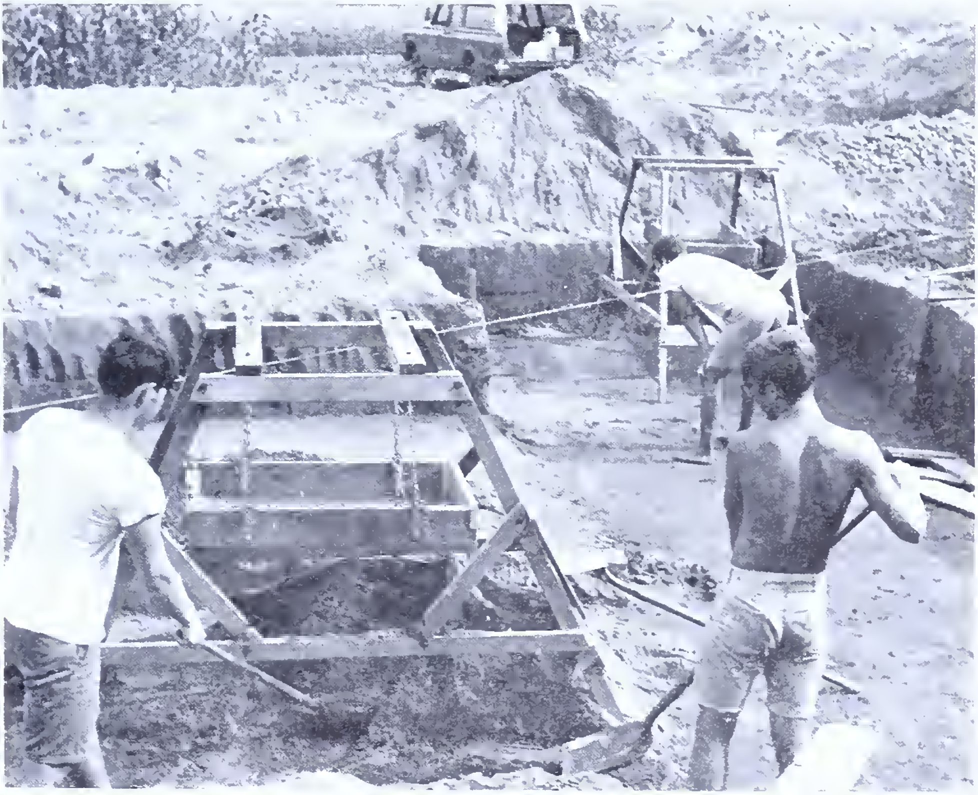


Fig. 59. GENERAL EXCAVATION SCENE of the deeper levels at the Faucett site.

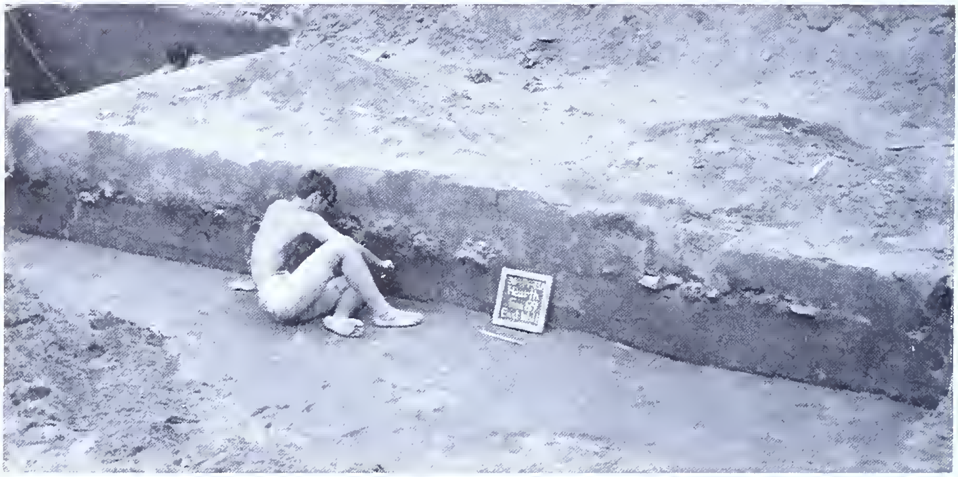


Fig. 60. PROFILE VIEW OF THE LARGE ORIENT HEARTH, Feature 89, at the Faucett site.

Orient point, and because of the high incidence of jasper spalls in the Orient levels, it is likely that these points were made at the site.

Both large and small rock-lined hearths are a trait of this culture. Charcoal collected from Feature 89 (Fig. 60) assayed at 810 B.C. ± 100 years (Y-2477) and dates this component. A considerable quantity of Exterior Corded/Interior Smoothed pottery of the Early Series was found around the perimeter of the hearth. It is not possible to state unequivocally that this pottery is in fact a part of the Orient component. A portion of the Meadowood component was also near the hearth, and with the uneven depth of the hearth itself it is difficult to interpret the associations.

These two components are not widely separated in time, and it might be that the pottery should be attributed to both the Orient and the Meadowood occupations. The hearth may still have been visible and intact at the inception of the Meadowood occupation. Soapstone bowls are a trait of either the Perkiomen or the Orient occupation.

MEADOWOOD

The Meadowood component occurs in three areas approximately corresponding to the horizontal distribution of the Orient component. This occupation follows a southwest to northeast line which extends for over 220 feet from the deeply excavated unit in the southwestern portion of the site plot through the large hearth to the deeply excavated unit along the northern perimeter. In the former area two Meadowood points occurred in two levels (18- to 24- and 30- to 36-

inch datum levels) of one square with a pestle-like implement. Only three sherds of Exterior Corded/Interior Smoothed pottery are present in that vicinity.

Around the perimeter of Feature 89, nine Meadowood points were found in four levels of five squares. Six were from the 18- to 24-inch datum level, one each from the two deeper levels, and one from the 3- to 12-inch datum level. This is the area for a concentration of Exterior Corded/Interior Smoothed pottery which occurs in some quantity (208 sherds) in association with Meadowood points.

In the third area five Meadowood points were found in four levels of five different squares, and one is from the square excavated by natural levels. A large, broad gorget (Fig. 53 E) was found with a Meadowood blade. The latter has a worn edge suggesting the possibility that it had been used as a tool. The gorget is definitely a trait of this component. Two hundred sixty-three sherds of Exterior Corded/Interior Smoothed pottery are found in this area, with more than 90 per cent occurring in three levels of several nearby squares. These are the 24- to 30-, 30- to 36-, and 36- to 42-inch datum levels.

Traits for the Meadowood component are Meadowood points and blades, a broad flat gorget, Exterior Corded/Interior Smoothed pottery, and probably pestles or pestle-like implements. Onondaga chert is used exclusively for the production of all Meadowood points and blades. The strong preference for this material is a diagnostic trait of the component. Spalls of Onondaga chert were not noted and the inference is that the points and blades were made elsewhere and that this occupation was of short duration.

Charcoal collected from a living zone in Square N110E0 at 30 inches below Datum 1 and associated with the diagnostic point type produced the date 750 B.C. ± 100 years (Y-2476). This is a reliable date for the Meadowood component.

MIDDLE WOODLAND—BUSHKILL COMPLEX

The occurrence of two diagnostic point types, Rossville and Lagoon, together with a small number of side-notched points and other distinctive traits, constitutes a newly recognized cultural expression for the Delaware Valley, and the term chosen to designate it is the Bushkill complex. Because of the variety of projectile point forms and pottery types, this is defined as a complex and not a phase. It seems unlikely that all of the cultural material included in the Bushkill complex would be the product of a single manifestation at a particular point in time. It is anticipated that with increased knowledge it should be possible to define at least two phases within the complex.

Originally when charcoal was collected from an occupational area in Square N130E40 at 12 inches below Datum 1 and submitted for analysis, it was felt that it would determine the age of the Bushkill complex. The result, A.D. 790 ± 120 years (Y-2475), is too late and it is inconsistent with four radiocarbon dates, 520 B.C. to 100 B.C. for the related Lagoon complex on Martha's Vineyard, Massachusetts (Ritchie 1969b: 224-7). Ritchie considers the Lagoon complex to range from late Early Woodland to early Middle Woodland. A date of 480 B.C. ± 80 years at the Miller Field site for a hearth with associated Rossville points and net-marked pottery provides an acceptable local date for the Bushkill complex. It is possible that the date of A.D. 790 ± 120 years pertains to a minor Kipp Island occupation of the Faucett site, since a Jack's Reef Corner-Notched point was found in the same square and level that supplied the charcoal for this date.

The three point types (29 Rossville, 14 Lagoon, 5 generalized side-notched) of this complex are nearly uniformly distributed throughout all sections of the excavation plot. Thirty-three squares yielded these types with only six squares containing two or more specimens. A majority have their greatest occurrence in the 6- to 12- to 18-inch levels. Much of this cultural assemblage was located either while flat shoveling after the bulldozer had removed the topsoil or in the subsequent level. None of the point types shows any evidence of clustering which might reflect lineage or family preference.

The circular configuration of postmolds in the eastern portion of the plot may represent a house pattern for the Bushkill complex. Both a Lagoon and a Rossville point were found within the postulated house as were the several pottery types. Other items include a bola stone, a netsinker, a hammerstone, and a workshop area with flint spalls. Few items pertaining to other components were found in the area of the house.

The stone tool industry and the ceramic assemblage for the Bushkill complex are present in impressive detail and quantity. There is, however, the likely possibility that not all of the non-diagnostic stone artifacts belong to this complex. Implements such as mullers, grinding stones, netsinkers, etc., from the later Owasco and Tribal components were doubtlessly scattered by plowing and thereby became mixed with some of the similar tools of the Bushkill component. It is not possible to distinguish a grinding stone or muller of the Bushkill component from similar items of Owasco or Tribal components.

The Bushkill complex includes:

Chipped Stone		
Rossville Points	29	(Fig. 53 A)
Lagoon Points	14	(Fig. 53 B)
Side-Notched	5	(Fig. 53 C)
Chipped Adze Blanks	2	(Fig. 56 E)
Biface Scraper	1	
Netsinkers	3	(Fig. 56 D)
Teshoas	5	
Heavy Chopper	1	
Adze (unfinished)	1	(Fig. 57 C)
Ground and Pecked		
Narrow Subrectangular Gorgets	4	(Fig. 56 A)
Bola Stones	3	(Fig. 56 C)
Celt	1	(Fig. 56 F)
Pestle	1	
Altered by Usage		
Hammerstones	2	
Mullers	7	(Fig. 57 B)
Grinding Stones	5	
Pitted Stones	2	
Anvil Stones	2	
Pestle-like Implements	3	(Fig. 57 A)
Pottery		
Brodhead Net-Marked	5 rim sherds	(Fig. 48 A)
	589 body sherds	
Vinette 1	2 rim sherds	(Fig. 48 E)
	213 body sherds	
Fabric-Impressed	1 rim sherd	(Fig. 48 C)
	152 body sherds	
Wiped	3 rim sherds	(Fig. 48 B)
	116 body sherds	
Dentate-Stamped	3 rim sherds	(Fig. 48 D)
	70 body sherds	
Workshops		
Large areas of argillite spalls	2	
Smaller areas of flint spalls	3	

Late Woodland

Twenty-three pits yielded diagnostic Owasco, Intermediate, and Tribal pottery. The same pits also contained other cultural materials. Owasco pottery was found in four pits, Intermediate pottery in one pit, and Tribal pottery in 16 pits. Two pits held both Intermediate and Tribal pottery. The pits are presumably relatively free of inter-component mixing. Tribal pottery occurs in pits in the following combinations:

Durfee Underlined and Otstungo Notched;
Durfee Underlined, Chance Incised, and Oak Hill Corded;

Durfee Underlined, Chance Incised, and Bowman's Brook Stamped;
Deowongo Incised and Oak Hill Corded;
Deowongo Incised, Bainbridge Linear, and Chance Incised (toy pot);

Kelso Corded and Milo Corded are associated in one instance.

During the time of the Tribal complex there was a variety of Chance phase pottery types in vogue. These types form no particularly meaningful settlement pattern or grouping. Instead, it seems that within certain limits they are randomly distributed, although pits with diagnostic Tribal pottery have an interesting distribution. With only a few exceptions, they form a continuous northeast-to-southwest band 50 feet wide by 120 feet long. Only two Owasco pits, 19 and 84, are found inside this area.

It is tempting to suggest that these features were enclosed by a longhouse structure. However, the size is somewhat greater than the typical longhouse of this period. A more likely explanation for the distribution of the pits is that they follow a slight rise of ground, which was utilized for the arrangement of storage pits because of better drainage.

A group of five Tribal pits and one Owasco pit was situated near the southwest corner of the site plot. These features are in alignment with the main band of pits, although there is a discontinuity. Pit 28 contained Overpeck Incised sherds and was located outside the concentration of pits.

Ten other pits held non-diagnostic stone tools such as celts, mullers, and grinding stones, but no pottery. In these instances it is not possible to determine the specific cultural affinity for this material. Four of these pits were within the main group of pits.

No additional significant information was revealed by more refined analysis of the Late Woodland pits. This period is represented by at least two components, Owasco and Tribal. The former is represented by two vessels of Kelso Corded (Fig. 49 k), a variant of Kelso Corded (Fig. 49 j), Milo Corded (Fig. 49 m), and an Owasco toy pot (Fig. 58). Stone tools are Levanna points (Fig. 52 A top row), notched and trimmed implements (Fig. 52 B), hoes, teshoas, and anvil stones.

Charcoal collected from refuse Pit 117, Square S30W120, yielded a radiocarbon date of A.D. 1310 ± 120 years (Y-2474) for the Owasco component. Pit 117 contained sherds of Kelso Corded, a Kelso Corded variant, Milo Corded, a cache of 16 notched and trimmed siltstone implements, and numerous spalls.

The Tribal component is represented by six Deowongo Incised vessels (Fig. 49 b, d), five Durfee Underlined vessels (Fig. 49 a, c), three Chance Incised vessels, one each of Otstungo Notched (Fig. 49 h), Bowman's Brook Incised (Fig. 49 l), Overpeck Incised (Fig. 49 g, i), and eight vessels of unidentified Tribal. The Intermediate pottery types, three vessels of Oak Hill Corded (Fig. 50 right), possibly two other Oak Hill Corded vessels, two vessels each of Bainbridge Linear (Fig. 50 left) and Bowman's Brook Stamped (Fig. 49 e, f), are postulated as additional pottery types of the Tribal component. Stone tools are Madison and Levanna points, notched and trimmed implements, netsinkers, teshoas, hoes, mullers, grinding stones, celts, hammerstones, sinew stones, heavy choppers, and smooth stones. Other items are an antler comb (Fig. 58), a shell bead (Fig. 58), and two clay pipes.

A pipe bowl fragment (Fig. 58) is done is a *pointillé* style. This technique is a late development and it is often considered to be historic. However, no European trade materials were found at the site. Two other traits, the collecting of fossils and the use of the strike-a-light, are associated with pits but were not found with any diagnostic pottery. These traits, together with some of the non-diagnostic household implements described for the Tribal component, are shared by the Owasco and Tribal components.

Charcoal from Pit 52, Square N100E0, was collected and assayed at A.D. 1410 ± 100 years (Y-2473). The feature contained a vessel of Oak Hill Corded (Fig. 50 right) and a rim sherd which is a variant of Durfee Underlined (Fig. 49 a), and flint spalls. This dates the Tribal occupation, and it is a more intensive occupation than the preceding Owasco one.

Stone artifacts of the Owasco and Tribal components are not quantified. This was not done because it is impossible to assign non-diagnostic artifacts to a specific component unless they are found in context with diagnostic materials.

ANIMAL REMAINS

Animal remains were sparse and very fragmentary. With one exception they were predictable and not especially instructive. Due to the limited quantity of these remains it was not possible to reach any meaningful conclusions regarding this material. The Tribal component contained remains of an estimated four deer, one elk, turtle (box ?), and a number of unidentified remains. Raccoon was apparently utilized by the people of the Bushkill complex. In addition to these, there are a number of small unidentified animal remains plus a domestic cat.

The most significant identification is that of a tooth of a mackerel shark from Owasco Pit 84. This indicates trade/travel connections with the Atlantic Coast. Perhaps the area for this trade/travel sphere is present-day metropolitan New York. Other Owasco remains from the same feature are raccoon and unidentified fish.

SUMMARY AND INTERPRETATIONS

Cultural progression at this multi-component site is established and supported by stratification, typological considerations, and seven radiocarbon dates. The earliest occupation is the Delaware Valley Archaic complex, which is recognized here by the Macpherson point type, possibly several weathered argillaceous shale knives, and a bipitted muller. The Brewerton point is a postulated cross-cultural trait which is radiocarbon dated to 3230 B.C. ± 200 years. The complex is more fully defined on pages 332-43) on the basis of work at the Egypt Mills and other sites.

The possibility of an even earlier occupation should not be discounted. Two possible spalls, one of argillaceous shale, were found 60 inches beneath the Brewerton point, which was located at 79 inches below Datum 1. This however, is only a tantalizing shred of evidence (see page 397). Possibly the Eshback point represents another unrecognized Late Archaic component.

The broadspear tradition follows the later part of the Delaware Valley Archaic complex. The Perkiomen component is radiocarbon dated to 1500 B.C. ± 120 years and is recognized by seven Perkiomen points, adze blanks, mullers, heavy netsinkers, and a possible notched spearthrower weight. There is a suggestion of the use of steatite bowls, and there is a strong preference for the use of jasper in the production of projectile points.

The Orient component is a well-established occupation represented by 24 Orient fishtail type points, a notched spearthrower weight, adze blanks, heavy rounded netsinkers, grinding stones, hammerstones, and a preference for jasper. Exterior Corded/Interior Smoothed pottery is possibly a trait of this component. A large irregular rock-lined hearth feature along with several smaller hearths of similar character are attributed to the Orient occupation. This component is radiocarbon dated to 810 B.C. ± 100 years.

The Meadowood component follows Orient and it is radiocarbon dated to 750 B.C. ± 100 years. This relatively brief occupation is represented by 15 Meadowood points and two cache blades (all of

Onondaga chert), a broad flat gorget, possibly Exterior Corded/Interior Smoothed pottery, and perhaps pestle-like implements.

The Bushkill complex (a newly postulated cultural expression) is considered a Middle Woodland occupation. Rossville, Lagoon, and a minor generalized side-notched projectile point form are diagnostic. Forty-eight of these three types are present. This intensive occupation was concentrated in the 12- to 18-inch level below datum and to a lesser extent in the immediately superior level. Flint and argillite are the preferred lithic materials for the production of Rossville and Lagoon points respectively. Brodhead Net-Marked is the major pottery type while Dentate Stamped, Wiped, Vinette 1, and Fabric-Impressed are minor types for the Bushkill complex. A possible Bushkill house pattern is circular with a diameter of 25 to 30 feet. Other traits include narrow subrectangular gorgets, adzes, netsinkers, grinding stones, mullers, bola stones, pestles, pestle-like implements with battered ends, hoes, teshoas, choppers, celts, anvils, and pitted stones.

A radiocarbon date of A.D. 790 ± 120 years is considered unsatisfactory for this complex. On the basis of four dates for a comparable complex in coastal Massachusetts it is suggested that an acceptable age range is from 520 B.C. to 100 B.C., while the date 480 B.C. from the Miller Field site is acceptable. In the future it may be possible to refine the Bushkill complex into two phases.

Late Woodland is represented by Owasco and Tribal components. Almost exclusively this material occurs in the context of refuse-filled pits.

The Owasco component is represented by Kelso Corded and Milo Corded pottery types. Included among the other Owasco traits are notched and trimmed implements, hoes, pestles, milling stones, mullers, netsinkers, teshoas, possibly a strike-a-light, and triangular arrow points. This component is radiocarbon dated to A.D. 1310 ± 120 years.

The Tribal component is represented by Deowongo Incised, Durfee Underlined, Chance Incised, Garoga Incised, Bowman's Brook Incised, Otstungo Notched, and Overpeck Incised pottery types. Intermediate pottery types, Oak Hill Corded and Bainbridge Linear, as well as Bowman's Brook Stamped apparently belong to the Tribal component. The stone tool assemblage is similar to the Owasco assemblage. Other Tribal artifacts are a shell bead, an antler comb, and a pipe decorated in a *pointillé* style. This component is radiocarbon dated to A.D. 1410 ± 100 years.

Brodhead-Heller Site*

3-Pi-7

INTRODUCTION

THE BRODHEAD-Heller site is located about eight miles north of Bushkill, Pennsylvania, at 41 degrees, 08 minutes, and 45 seconds north latitude and 75 degrees, 55 minutes, and 00 seconds west longitude. The occupation extends over the two lowest river terraces, with the southeastern most portion of the site about 30 feet above normal water level. The property belongs to several heirs of the late Edna Brodhead-Heller, and a son, Joshua Heller, is the present tenant farmer.

The site is well known to local collectors and amateur archeologists. In 1964 the Tocks Island Site Survey surface hunted on the property and mapped its location. A broken jasper Clovis point was found and there were numerous jasper spalls found along the river bank. The following year subsurface features were located after extensive test trenching. In 1966 McNett, then at Baylor University, Waco, Texas, conducted an archeological field course for academic credit on the site in cooperation with Kinsey's archeological salvage work in the Tocks Island Reservoir. Baylor University Graduate Faculty Research Committee Grant 573 provided funds for partial support of this investigation. A preliminary paper (McNett 1967) reports on the excavations of the 1966 season. Archeological investigations were continued in 1967 with funds provided by the National Park Service as part of the program to salvage as much information as possible from certain selected sites before inundation.

Over a two-year period, 396 man-days were spent excavating the Brodhead-Heller site. Twenty-one 10-foot squares were cleared to the subsoil for a total horizontal plot of 2,100 square feet. Eleven contiguous squares in an area 30 by 40 feet were dug to varying six-inch level depths ranging from 24 to 84 inches below datum. Three five-

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*This chapter was co-authored by W. Fred Kinsey, III, and Charles W. McNett, Jr., associate professor of anthropology, American University, 1967—, Washington, D.C. 20016.

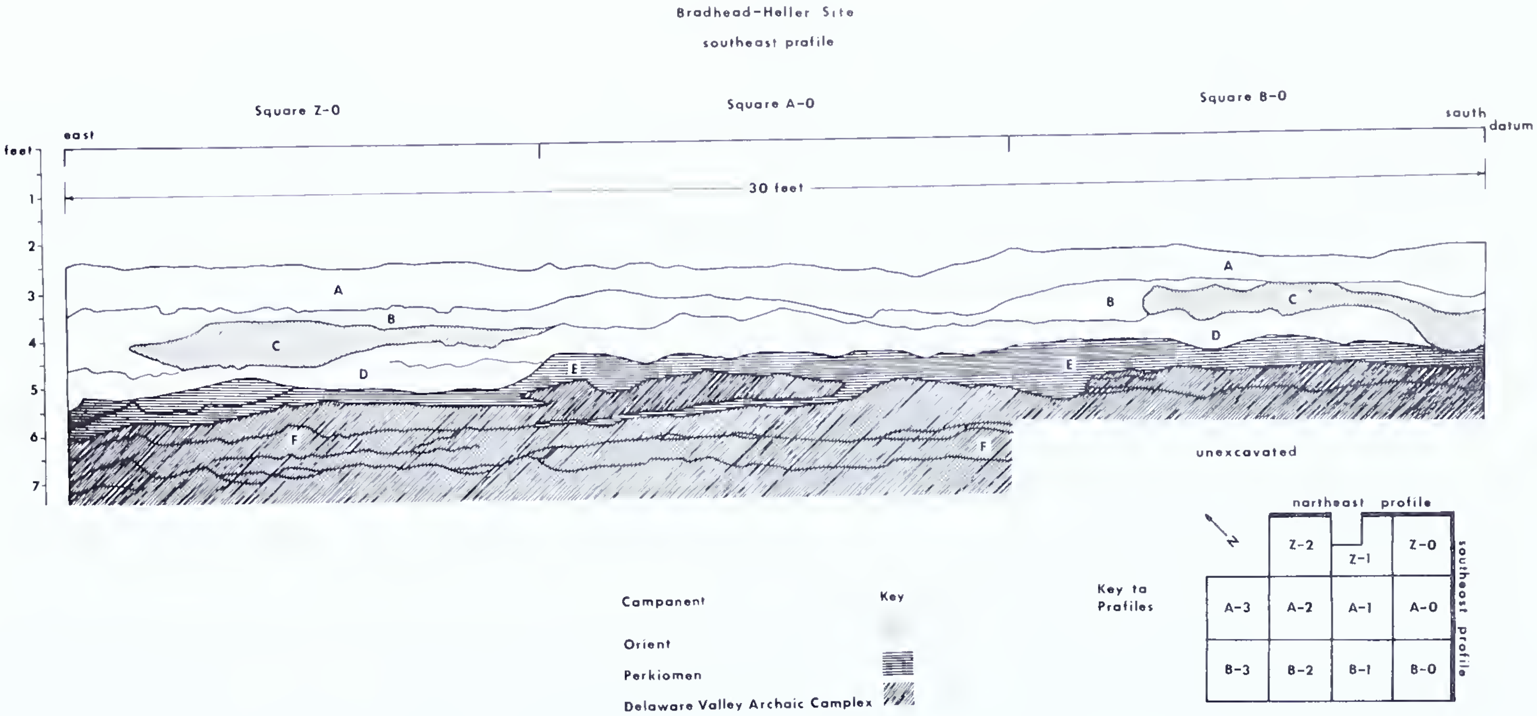


Fig. 61. DRAWING OF THE PROFILE of the southeast walls of squares Z-O, A-O, and B-O at the Brodhead-Heller site: A topsoil, mixed Late Woodland; B, tan alluvium, Middle and Early Woodland; C. tan alluvium, Orient/Dry Brook; D, tan sand zone (a and b), nearly sterile; E, dark reddish zone, Perkiomen; F, compact, clayey alluvium, Delaware Valley Archaic complex.

foot sections of Square Z1 were excavated by natural levels. A stratified sequence was obtained from these 11 squares. (Figs. 61, 62)

The soil at Brodhead-Heller is alluvium of medium-sized grains. A rich fertile dark brown topsoil overlies the subsoil and ranges from 12 to 18 inches thick. Beneath the topsoil there is a lighter-colored tan alluvium of similar texture. This zone varies from 6 to 17 inches in thickness. Below the tan alluvium are two sand zones varying in color from light tan to whitish gray. The upper and lower sand zones are irregularly interrupted and separated by a dark, reddish-brown zone. In places the latter is as much as 15 inches thick, while in other places it becomes narrow and terminates. The upper sand zone is designated Tan Sand A while the lower zone is Tan Sand B. The A zone is from 3 to 20 inches thick and the B zone is 12 to 24 inches thick. Beyond this depth the alluvium becomes more compact and clayey.

Where the reddish-brown zone is absent, the A and B zones are divided by multiple irregular reddish-brown bands or lenses of concentrated iron oxide-coated clay minerals. The minerals are leached from the overlying alluvium deposits by the process of podzolization (see pages xiii-xvi) . These lenses also occur in both the A and B sand zones, but they are much more prevalent in the B zone. The distinction between the A and B zones is not always clear-cut, but the increased occurrence of the reddish-brown lenses serves as a boundary whenever the dark reddish-brown zone is absent. (Note: The terms A and B zones do not refer to the standard terms used to designate soil profiles. They are used here to describe archeological stratification.)

Soil tests for acidity revealed pH values of 6.2 for the topsoil, 6.2 for the tan alluvium, and 5.6 for the tan sand. This is indicative of mildly acid soil conditions, and it helps to account for the poor preservation of organic remains.

FEATURES

Much of the cultural material was associated either with pits or hearths, although some Late Woodland and earlier remains were scattered throughout the topsoil as a result of the farmer's plow and the activities of burrowing animals.

Level I contained ten intentionally dug pits and yielded most of the Owasco and Tribal pottery. The pits also contained triangular points, roughly worked stones, a teshoa, an abraded stone, spalls, and scraps of animal bone. Ten pits were located and cleared and they

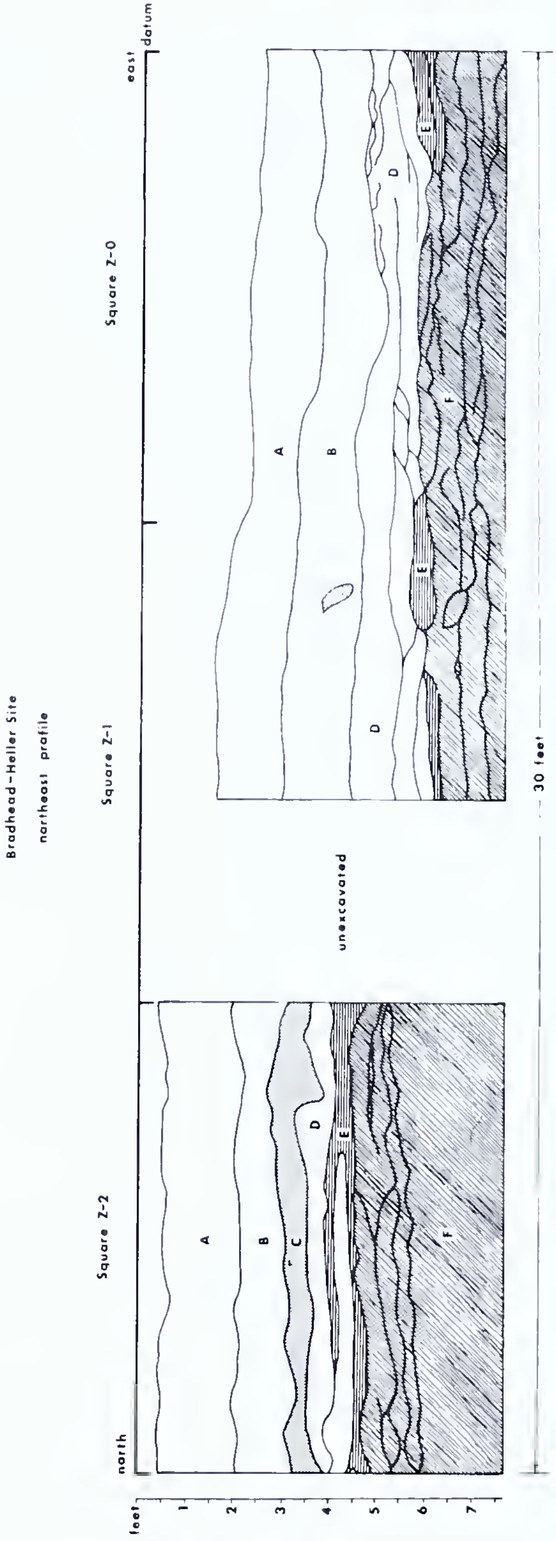


Fig. 62. DRAWING OF THE PROFILE of the northeast walls of squares Z-O, Z-1, and Z-2 at the Brodhead-Heller site.

conform to the following configurations: basin (6), bell (2), saucer (1), and shallow cone (1). The only sterile pit was the shallow cone type. Pits were dug into the tan alluvium from a previous ground surface. Eleven small disturbances were also found in the subsoil as a result of human activities. For the most part these were areas containing small amounts of charcoal and fire-reddened soil.

Fifty-nine postmolds were present. A configuration of 13 postmolds forms a semicircle with a diameter of about 25 feet. The pattern could not conveniently be completed because it extended into a wood lot on adjacent property, where the roots of trees would have obliterated or obscured most of the unexcavated postmolds required to complete the circular house pattern.

It is likely that the postulated house represents a late Owasco pattern. Feature 24, a bell-shaped pit containing Milo Corded and a variant of Bainbridge Linear, was located in the approximate center of the pattern. This pit also contained some organic matter which may have been the faint trace of a lining.

No other discernible pattern is created by the remaining postmolds.

Level IIa, the Orient component, is a large hearth area (Figs. 61 c; 62). The hearth is composed of a considerable quantity of angular fire-cracked and reddened sandstone fragments. These are the shattered remains of river cobbles, about the size of a fist, collected from along the nearby river bank. The cobbles have been broken from heat, and interspersed among the fire-cracked rocks is charcoal in varying amounts.

As speculation, it would seem that very long and intense heat from a wood fire would be required to fracture rocks into so many fragments. Water poured over hot rocks would cause them to crack more readily. The absence of mammal or fish remains and the relatively restricted range of the associated stone tool assemblage are puzzling, and add to the difficulty of interpreting these distinct cultural features. The exact use of this hearth and other similar hearths is unknown, but it is believed that they reflect community involvement or participation in a specialized food collecting and preparation activity.

Although the hearth area is not continuous, it occupies portions of nine of the eleven deeply excavated squares and it occurs in the levels between 18 and 42 inches below datum. This is the context for the Orient and Dry Brook projectile points, and there is a high incidence of jasper chips (363) and flint chips (156). Clearly, the limits of the hearth area have not been determined, as this intensive occupation extends beyond the boundaries of the area investigated.

Three main concentrations of charcoal and six smaller clusters were observed, although charcoal is distributed throughout the entire hearth zone. It is not possible to determine if the hearth is actually a single feature that has been slightly dispersed or if there are as many as five intensive concentrations of hearth features packed into a restricted living area. The interpretation of the hearth as a single feature is the favored viewpoint.

Feature 26 is a very small rock-filled hearth about 12 inches in diameter. It was located in the 54- to 60-inch datum level of Square Z2. This feature intruded into Level IV from a later living surface associated with the tan sand zone. The level of this hearth is designated Level IIb. A polished adze, two argillite Normanskill-like points, and numerous (166) argillite chips were found nearby at this feature level.

Level III is the hearth area for the Perkiomen component and is associated with the baked clay band between the A and B zones of the tan sand (Figs. 61 E; 62). Like the Orient hearth, the Perkiomen hearth is found in 9 of the 11 deeply excavated squares. It also extends beyond the limits of the excavation plot. The level of the Perkiomen hearth ranges from 30 to 48 inches below datum, and it is separated physically from the overlying fishtail hearth by relatively sterile sand. It is a distinct single hearth feature, measuring 20 feet across and over 30 feet long, conforming to no geometric shape, which can be only imprecisely described as an irregular oval. In cross section the hearth is saucer-shaped, having a deeper midsection and becoming narrower toward the perimeter.

Within the area of the fire-cracked rock there is a dense concentration of charcoal measuring about 12 feet long by 8 feet at its greatest width. A highly stained and burnt area about 18 by 15 feet surrounds the charcoal concentration.

In addition to Perkiomen points, drills, and scrapers, there are five Lehigh and two Susquehanna points, mullers, adzes, and a high concentration of jasper chips (1,543) surrounding the hearth. Argillite (400 chips) is the second most popular lithic material. As in the Orient hearth there is an absence of animal and fish remains.

Level IV includes the 48- to 76-inch datum levels (Figs. 61 F; 62). Seven of the eleven squares were excavated to these depths. No single feature dominates this level. Four small rock-lined features and five stained and burnt features were located. The rock features are fireplaces with diameters of 6, 9, 10, and 24 inches respectively. The other features are fire-reddened and burnt patches of soil, with some charcoal present. Level IV contains the local Delaware Valley Archaic complex, which in this level is represented by the Lackawaxen Stemmed points (Expanded Base subtype) and the Macpherson point. The latter occurs near the top of Level IV and the bottom of Level III. A single spearthrower weight was found in Level IV.

POTTERY

The pottery sample from the Brodhead-Heller site is relatively small, due to the limited size of the excavation plot and the largely preceramic nature of the components. Had a larger horizontal area been cleared, it is likely that more pottery would have been discovered, and more Late Woodland pits would have been found.

EARLY SERIES

With perhaps three exceptions, pottery of the Early Series is either Vinette 1 or Exterior Corded/Interior Smoothed. Most of this pottery is extremely fragmentary and deeply weathered. Because of these conditions, it is not always possible to distinguish between types with certainty. The Early Series is similar to the equivalent types from the Faucett site, although at the latter site it was generally possible to distinguish between two varieties of early cord-marked pottery. At Brodhead-Heller, context is the major factor in identification since all of this pottery comes from 18- to 24-, and 24- to 30-inch datum levels of the tan alluvium.

Most of the identifiable Owasco pottery was found in pits. Numerous small corded body sherds were scattered throughout the topsoil, with very few in the tan alluvium. Except for slight variations, the Owasco pottery is easily accommodated into the existing Owasco types. A variant Bainbridge Linear vessel is from Pit 25, located within the probable circular house. It has a medium high collar decorated with unevenly spaced and inexpertly executed fine line incising. There are five to seven of these irregular lines, and a similar band of five to six lines is at the shoulder. The lip is smoothed and flattened with short incisings present on the exterior lip edge. Incipient castellations are present. Between the shoulder and the lip, the surface treatment is smooth, while below the shoulder the cord-markings have been partly obliterated. The clay is tempered with crushed rock, including quartz. Color ranges from orange-tan to darker tan-grays.

Two Tribal rim sherds are from Pit 4. One is Munsee Incised and the other Deowongo Incised. The former consists of a rectangular plat under a castellation. Short incised lines cross the plat at right angles producing a ladder effect. Parallelogram plats are on either side, and the resulting right angle is filled with incised lines. The collar is medium high with notching on the lower edge absent. The lip is flattened and the exterior edge is slightly notched. The temper is finely crushed quartz, mica, and other materials.

The following pottery types are recognized:

Early Series	
Vinette 1 or Exterior Corded/Interior Smoothed	87 body sherds
Fabric-Impressed (probable)	2 body sherds
Dentate-Stamped	1 body sherd

	Estimated Number of Whole Vessels Based Upon Rim Sherds		
Owasco			
Sackett Corded	4	30.7%	
Owasco Corded Punctate	3	23.0%	(Fig. 85 M)
Kelso Corded (1 variant)	2	15.5%	(Fig. 74 C)
Milo Corded	1	7.7%	
Unidentified Owasco	2		
Intermediate			
Bainbridge Linear (variant)	1	7.7%	
Tribal			
Deowongo Incised	1	7.7%	
Munsee Incised	1	7.7%	
Unidentified Tribal	3		

STONE ARTIFACTS

PROJECTILE POINTS—155

The following categories are used to classify and describe the various projectile points from the Brodhead-Heller site. Measurements are not given for broken and reworked specimens or when considered unimportant.

Late Woodland	
Madison—13 (Fig. 63 B)	
Lithic preference	
Flint	13
Levanna—8 (Fig. 63 C)	
Lithic preference	
Flint	7
Chalcedony	1

There are three flint blanks and one chert blank which are probably Levanna forms.

Elongated Triangular—1 (Fig. 63 D)

Lithic preference	
Flint	1

Length (inches)	Width	Thickness
2.17	.80	.22

Middle Woodland

Rossville—3

Lithic preference	
Flint	2
Argillite	1

Generalized Side-Notched—5 (Fig. 63 E-H)

Lithic preference	
Flint	4
Jasper	1

	Length (inches)	Width	Thickness
Range	2.67-1.49	1.50-.65	.35-.21
Average	1.87	.92	.28

(based upon 4 specimens)

The points in this group have small side notches and slightly convex blade edges and base. The large jasper specimen (Fig. 63 H) has been used as a knife, while another example (Fig. 63 F) has been used as a drill or reamer. The former has a reverse bevel on surface edges.

Early Woodland—Fishtail Tradition

Orient—16 (Fig. 63 L-R)

Lithic preference	
Jasper	7
Flint	5
Chert	4

	Length (inches)	Width	Thickness
Range	2.12-1.65	.86-.67	.29-.25
Average	1.93	.75	.27

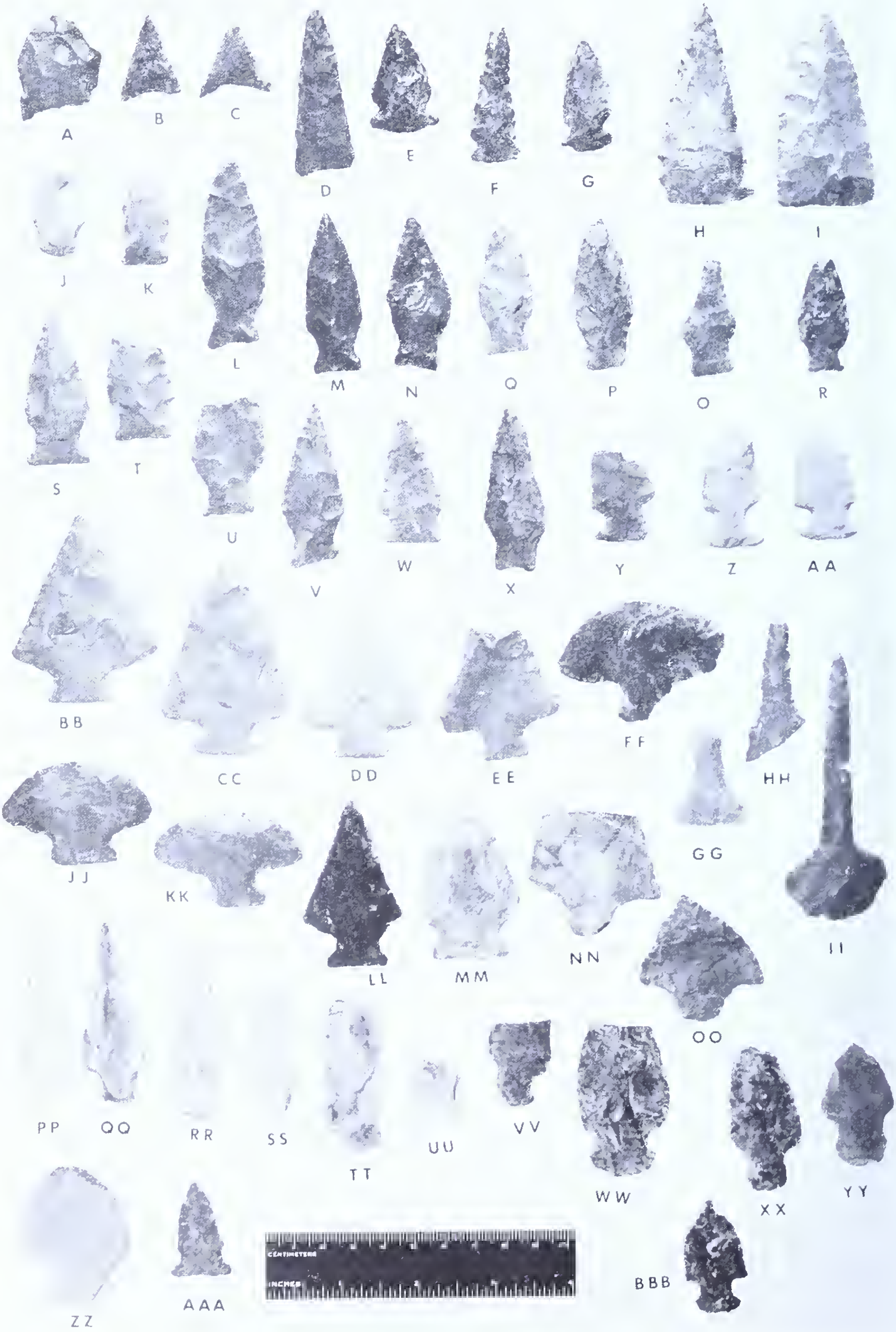
(based upon 5 specimens)

Six Orient points have been reshaped and used as knives, drills, or reamers (Fig. 63 Q, R). Similar use may account for the fact that several others in this type group are broken.

Late Archaic—Fishtail Tradition

Dry Brook—11 (Fig. 63 S-X)

Lithic preference	
Chert	10
Flint	1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ZZ
AAA
CENTIMETERS
INCHES
BBB

	Length (inches)	*Width*	*Thickness*
Range	2.20-1.68	.84-.79	.37-.20
Average	1.99	.82	.28

(based upon 5 specimens)

Late Archaic

Normanskill-like—3 (Fig. 63 Y-AA)

Lithic preference

Argillite	2
Flint	1

These last three points are a distinctive and unnamed type. They are characterized by wide and deep side notches, and they closely resemble at least one of the Normanskill-like points in the Macpherson Collection. Probably they constitute a type, but there are insufficient data available to define them. Shoulders are sharp and blade edges are straight. Two specimens have straight bases while the third example has a slightly convex base. Bases are expanded to nearly equal the width of the shoulder. Basal ears are sharp. All three excavated examples are broken.

←

Fig. 63. PROJECTILE POINTS, DRILLS, AND SCRAPERS from the Brodhead-Heller site: A, Clovis fluted point, surface, jasper; B, Madison point, Feature 4, flint; C, Levanna point, topsoil, flint; D, elongate triangular point, topsoil, flint; E, G, generalized side-notched points, 18″-24″, flint; F, generalized side-notched point, Feature 22, flint; H, generalized side-notched point, 18″-21″, jasper; I, Meadowood blade, 36″-42″, jasper; J, small stemmed point, hearth, argillite; K, shallow side-notched point, 36″-42″, argillite; L, Orient point, 24″-30″, chert; M, Orient point, 18″-24″, jasper; N, Orient point, topsoil, jasper; O, Orient point, 30″-36″, chert; P, Orient point, 30″-36″, flint; Q, Orient drill, 30″-36″, chert; R, Orient scraper, tan sand, jasper; S, Dry Brook point, tan alluvium chert; T, V, Dry Brook points, 30″-36″, chert; U, Dry Brook point, topsoil, chert; W, Dry Brook point, 24″-30″, chert; X, Dry Brook point, 18″-24″, flint; Y, Normanskill-like point, 30″-36″, chert; Z, Normanskill-like point, 42″-48″, argillite; AA, Normanskill-like point, 36″-42″, argillite; BB, Perkiomen broad spear, 36″-42″, jasper; CC, Perkiomen broad spear, 30″-36″, jasper; DD, Perkiomen broad spear, 42″-48″, argillite; EE, Perkiomen broad spear, hearth zone, jasper; FF, Perkiomen scraper, 45″, jasper; GG, drill, 30″-36″, chalcedony; HH, drill, 36″-42″, chert; II, drill, 36″-42″, jasper; JJ, Perkiomen scraper, 36″-42″, jasper; KK, Perkiomen scraper, 30″-36″, jasper; LL, Susquehanna broad spear, 30″-36″, jasper; MM, Susquehanna broad spear, 42″-48″, rhyolite; NN, Koens-Crispin broad spear, 36″-42″, argillite; OO, Lehigh broad spear, 42″-48″, jasper; PP, TT, UU, Lackawaxen Expanded Stem points, 48″-54″, argillaceous shale; QQ, Lackawaxen Expanded Stem point, 36″-42″, argillaceous shale; RR, SS, Lackawaxen Expanded Stem points, 42″-48″, argillaceous shale; VV, Macpherson point, 48″-54″, flint; WW, Macpherson point, surface, flint; XX, BBB, Macpherson points, 42″-48″, flint; YY, Macpherson point, topsoil, argillite; ZZ, Egypt Mills point, 42″-48″, argillite; AAA, Brewerton Eared-Notched point, 42″-48″, chert.

Late Archaic—Broadspear Tradition

Perkiomen—23 (Fig. 63 BB-EE)

Lithic preference

Jasper	20
Argillite	2
Chalcedony	1

	Length (inches)	*Width*	*Thickness*
Range	2.52-2.03	1.90-1.51	.29-.19
Average	2.35	1.68	.25

(based upon 3 specimens)

Five Perkiomen basal fragments have been rechipped and made into crescent-shaped scrapers (Fig. 63 FF, JJ, KK) and the working edge of these scrapers has been worn smooth.

Susquehanna—2 (Fig. 63 LL, MM)

Lithic preference

Flint	1
Rhyolite	1

	Length (inches)	*Width*	*Thickness*
Range	2.23-2.05	1.31-1.23	.30-.23
Average	2.14	1.27	.27

(based upon 2 specimens)

Because the rhyolite specimen (Fig. 63 MM) has been reshaped and used as a drill or reamer, it is shorter than its original length. The other example might have been utilized as a knife.

Lehigh/Koens-Crispin—5 (Fig. 63 NN, OO)

Lithic preference

Jasper	3
Argillite	2

Delaware Valley Archaic Complex

Macpherson—5 (Fig. 63 VV-YY, BBB)

Lithic preference

Flint	5

	Length (inches)	*Width*	*Thickness*
Range	2.30-1.62	.95-.82	.34-.25
Average	1.96	.89	.32

(based upon 2 specimens)

This is a newly recognized type which has been defined and named Macpherson. These are side-notched points with a rounded and expanded stem. Overall, they have a rough appearance and they are rather crudely executed. In cross section they are irregular, with one side having a high medial ridge. The point type is unevenly thickened near the junction of the blade, and the stem and base are convex. The ears are sharp on some specimens and rounded on others. Two of the specimens are reworked. One was used as a drill and the other as a knife.

Chronologically, Macpherson points are earlier than Perkiomen and Lehigh and are partly contemporaneous with Brewerton and Lackawaxen types. At both the Brodhead-Heller and Faucett sites, Macpherson points are found below Perkiomen and Lehigh, but above traits representing Brewerton and the Delaware Valley Archaic complex.

Lackawaxen Expanded Stem Subtype—7 (Fig. 63 PP-UU)

Lithic preference	
Shale	7

	Length (inches)	*Width*	*Thickness*
Range	2.52-2.20	.85-.70	.35-.27
Average	2.39	.76	.31

(based upon 4 specimens)

These are Lackawaxen Stemmed points of the Expanded Stem subtype. Bases are straight and slightly expanded and unretouched on two examples. One point has been used as a knife and another appears to have been used as a reamer.

Egypt Mills—2 (Fig. 63 ZZ)

Lithic preference	
Argillite	2

These two broad-bladed points have converging stems and rounded bases, and they are similar to the Egypt Mills type as identified from the site of the same name. The specimens were reworked and apparently used as knives or scrapers.

Small Side-Notched—3 (Fig. 63 J, K)

Lithic preference	
Argillite	3

Two are small side-notched specimens with an expanded base. A third point with faint side notches and a very slightly expanded base is possibly a member of this category. These three examples are broken and apparently reused.

Brewerton

Brewerton Eared-Notched—1 (Fig. 63 AAA)

Lithic preference	
Chert	1

Length (inches)	*Width*	*Thickness*
1.23	.79	.26

This is not a typical example of the type, but it is within the accepted range. It is rather inexpertly chipped and has a straight base (which may be broken) instead of the concave base form which is more prevalent on this type.

Paleo-Indian

Clovis—1 (Fig. 63 A)

Lithic preference

Jasper	1

A broken fluted point was found on the surface. It is thermal fractured and too fragmentary for meaningful measurement. The basal concavity and the intact edge near the ear are lightly ground.

Miscellaneous

Type			*Level*
Bifurcate-Stemmed	1		0-18 inches
Small Stemmed	2		surface
Stemmed, Straight Base	3		topsoil (2) 36-42 inches (1)
Meadowood-like Blade	1	(Fig. 63 I)	36-42 inches
Small Side-Notched	2		surface (1) 18-24 inches (1)
Possible Side-Notched	2		0-18 inches (1) 30-36 inches (1)

The miscellaneous points are either of no known type, or are too fragmentary or too nondescript for more precise identification. The small-stemmed points and straight-based points may be variants of the Delaware Valley Archaic complex, but at present not enough is known about the range of these types to include them in this classification.

There are tips and midsections of 35 specimens that cannot be classified and there is one knife of no known type. There are also three argillite fragments which are possibly blanks for knives or points.

Drills—7 (Fig. 63 GG-II)

Lithic preference

Jasper	3
Chert	2
Chalcedony	2

The Perkiomen "drill" (Fig. 63 II) is exceptionally long and thin, and it is seemingly too fragile to have been practical for use as a drill or reamer. Speculatively, it might have served as a pin to hold clothing or a robe secure. The base of one of the chalcedony drills is ground smooth (Fig. 63 GG). It may have been intentionally ground or worn from use as a scraper. In any case the edge is flat and very smooth.

OTHER STONE TOOLS

Three categories, Chipped, Ground and Pecked, and Altered by Usage, are used to describe and classify the stone tool inventory. When certain items require additional comment, those remarks follow each category:

Chipped

Projectile Points (including fragments and five Perkiomen points rechipped as scrapers)	155	
Blanks or Knives	7	
Drills	7	(Fig. 63 GG-II)
Adze Blanks	4	(Fig. 64 A, C, D)
Notched and Trimmed Implements	4	
Heavy Choppers	3	(Fig. 64 O)
Teshoas	3	
Large Spalls	4	
Netsinkers	10	(Fig. 64 H, I)
Bifaces	3	
Celts (unfinished)	3	(Fig. 64 E)
Chipped River Pebbles	2	

Spalls: Jasper 2,339, Flint 1,023, Shale/Argillaceous Shale 844, Chert 568, Chalcedony 60, Rhyolite 17, Others 6

Total ... 205
or 82.4% of the sample

Adze blanks are made of dense siltstone cobbles, and the percussion chipping is primarily confined to the edges and part of the bit.

The notched and trimmed implements of metamorphosed siltstone are identical to the cache of 16 from the Faucett site, as well as those from other sites in the Upper Delaware Valley. One example is too fragmentary for positive identification.

Neither the bifaces nor the large spalls show evidence of wear. The former are distinguished from the latter by the fact that they have been worked on both surfaces. The spalls were formed by a single percussion blow with no subsequent alteration. Two of the bifaces are broken at the approximate midsection, while the intact biface is oval in outline and measures 4.0 inches long by 2.5 inches wide. The essential difference between the bifaces and the heavy choppers is that an edge of the latter group has been trimmed. These tools were used as heavy cutting and chopping implements.

Unfinished chipped celts are included in this category since chipping is the only method of manufacture applied to the artifact. Obviously the celts would have been completed by pecking and grinding.

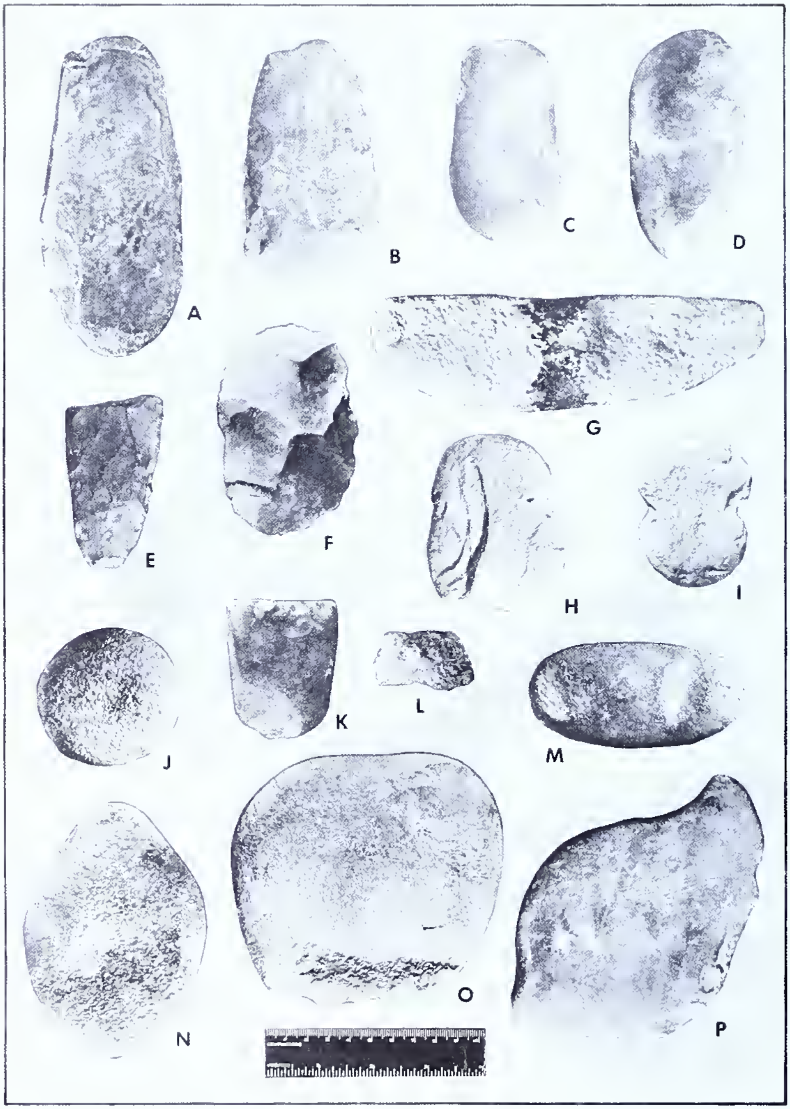


Fig. 64. POLISHED, GROUND, AND CHIPPED STONE ARTIFACTS from the Brodhead-Heller site: A, adze blank, Feature 1, siltstone; B, chipped celt, 48″-54″, siltstone; C, D, chipped adze blanks, 42″-48″, siltstone; E, chipped celt, 30″-36″, siltstone; F, chipped biface, 36″-42″, siltstone; G, spear thrower weight, 60″-66″, siltstone; H, netsinker, 24″-30″, sandstone; I, netsinker, surface, sandstone; J, muller, 42″-48″, sandstone; K, polished adze blank, 60″, shale; L, steatite bowl fragment, 18″-24″; M, abrading stone, 36″-42″, sandstone; N, pitted muller, 24″-30″, sandstone; O, chopper, 42″-48″, sandstone; P, abrading stone, 36″-42″, siltstone.

One of the two natural water-worn stones is flat and disc-shaped and the other is subrectangular. The latter has a chipped and worn edge while the former is possibly notched. Their function is problematical.

Ground and Pecked

Celts (unfinished)	4	(Fig. 64 B)
Adze	1	(Fig. 64 K)
Spearthrower Weight (unfinished)	1	(Fig. 64 G)
Total or 2.4% of the sample	6	

None of the four celts is intact. In fact, one is represented by such a small fragment that it is not possible to be certain that it is a celt. One example with a partly rechipped bit has been broken. A narrow-bitted specimen has had its entire surface pecked but not ground smooth. A fourth siltstone fragment is a bit edge consisting of two matching pieces from the same level (18- to 24-inch datum level) of different squares. These fit together perfectly but, interestingly, one fragment is black and the other red. Presumably, the red fragment was altered by contact with fire, although it is not fire-spalled.

The adze is a part of a bit (from Feature 26, a hearth) which has been partly ground smooth. The opposing edges on the long sides are slightly beveled by grinding along the top and bottom surface.

The unfinished winged spearthrower weight measures 7.25 inches long by 2.05 inches wide at the midsection. It is made of siltstone, and was altered to its present form by pecking and grinding. No attempt has been made to drill the hole to accommodate the shaft, and polishing is incomplete.

Altered by Usage

Mullers		15	(Fig. 64 J, N)
Plain Mullers	5		
Pitted Mullers	10		
Grinding Stones		5	
Natural Stones		5	
Hammerstones		6	
Anvil/Hammers		2	
Anvil		1	
Abrading Stone		4	(Fig. 64 M, P)
Total or 15.2% of the sample		38	

Mullers are fist-sized hand-stones of which two-thirds are pitted. Some pits are deep depressions while others are very shallow. Slight traces of pitting or scarring are present on a few of the plain mullers, but in these instances it was considered too faint to be classified as a pit.

A siltstone grinding stone, with large spalls removed from three sides, is of considerable size and weight (14 inches long by 9 inches wide by 5½ inches thick). It is ground on both surfaces and one surface is scarred from use. Two possible grinding stones are small, flat, sandstone river cobbles. The remaining two items are typical grinding stones.

The group of four abrading stones all exhibit intensive wear or polish resulting from rubbing or abrading. A broken river cobble has two highly polished surfaces, a concave surface on the flat of the cobble, and a highly worn area concentrated at the broken edge. Another river stone has a larger well-polished and slightly concave surface on the flat side of the stone. A thin and flat water-worn stone has been chipped along one edge and worn smooth from use. Striations are present on the flat surface. The fourth specimen, a subrectangular river cobble, has two deep abrasion scars on each side near both ends. These are deeply worn patterns but they are not polished. Actual use of the four abrading stones is conjectural.

A large heavy sandstone river cobble is scarred on both surfaces, and these scars are a probable consequence of the surface being used as an anvil.

Four flat natural stones and one rounded stone may have had a purpose although they show no indication of use. With one exception, these smooth natural stones were found in subsurface context.

The anvil/hammers are hand-sized, subrectangular, natural river cobbles with a scarred anvil surface and a worn end. This was apparently caused by use as a hammer. They are both from Feature 1.

Associations

Three stratified occupational zones together with pits dug into the tan alluvium provide the basis for cultural context. Stratification results from natural soil processes and occupational staining. Owasco and Tribal components are found in pits intrusive to the tan alluvium.

Displaced specimens from the major components found out of context are not included in the quantification and the description of these several cultural components.

Delaware Valley Archaic Complex

Level IV, Tan Sand Zone B, yielded the cultural manifestation of the newly postulated Delaware Valley Archaic complex. This complex is partly coeval with Laurentian, but locally it endures for a longer span of time. The Lackawaxen phase is the dominant component of this culture complex during the Late Archaic in the Upper

Delaware Valley. The projectile point assemblage for the Delaware Valley Archaic complex contrasts sharply with Brewerton-Laurentian types.

Chipped Stone

Lackawaxen Expanded Stem Subtype	7	(Fig. 63 PP-UU)
Macpherson	3	(Fig. 63 VV-YY, BBB)
Egypt Mills	2	(Fig. 63 ZZ)
Stemmed Straight Base	1	
Brewerton Eared-Notched	1	(Fig. 63 AAA)
Adze Blanks	2	(Fig. 64 D, K)
Chipped Celts (unfinished)	2	
Chipped Pebble	1	
Chopper	1	(Fig. 64 O)
Knife	1	

Spalls: Argillite 69, Flint 19, Jasper 13, Chalcedony 2, Chert 2, Quartz 1

Ground Stone

Spearthrower Weight (unfinished)	1	(Fig. 64 G)

Altered by Usage

Mullers, Pitted	2	(Fig. 64 J)

Features of the Delaware Valley Archaic complex are small rock-lined fireplaces ranging from about 6 to 24 inches in diameter.

Broadspear Tradition—Perkiomen Component

Level III, the Perkiomen hearth, contains the cultural manifestation of the Perkiomen broadspear component. This occupational level separates the A and B tan sand zones.

Chipped Stone

Perkiomen	14	(Fig. 63 BB-EE)
Lehigh/Koens-Crispin	5	(Fig. 63 NN, OO)
Susquehanna	2	(Fig. 63 LL, MM)
Drills, Perkiomen	3	(Fig. 63 HH, II)
Scrapers, Perkiomen	6	(Fig. 63 FF, JJ, KK)
Adze Blanks	2	(Fig. 64 C, D)
Biface, Elongate	1	(Fig. 64 F)
Blank	1	
Chipped Pebble	1	
Chopper	1	
Spall, Large	1	

Spalls: Jasper 1,543, Flint 169, Chert 45, Chalcedony 26, Shale 1

Ground Stone

None

Altered by Usage

Abrading Stones	3	(Fig. 64 P)
Grinding Stone	1	
Hammerstone	1	

A large hearth measuring more than 20 by 30 feet and densely packed with fire-spalled sandstone river cobbles is the single feature of this component.

Unnamed Component

Level IIb is a minor component, and it remains unnamed since very little is known about its distinctive projectile point type and the accompanying cultural assemblage. The component is recognized by three distinct, wide, and deeply side-notched Normanskill-like points (Fig. 63 Y-AA). Two are made of argillite and one is fashioned from flint. (Possibly two other side-notched points of argillite are members of this type group.) One of the argillite specimens is associated with Feature 26, a small rock-lined hearth. The hearth was located in the reddish-brown lenses between Tan Sand A and B. Nearby were numerous argillite chips, and it is obvious that this is the preferred lithic material for this component. Four hundred argillite spalls were from Levels IIb and III, but it is impossible to determine which of these might belong to the Perkiomen component and which to Level IIb.

Fishtail Tradition—Orient Component

Level IIa holds an Orient/Dry Brook component found in the upper hearth zone of the tan alluvium. Evidently the stained hearth zone is derived from the tan alluvium through occupational activities.

Chipped Stone		
Orient	16	(Fig. 63 L-R)
Dry Brook	11	(Fig. 63 S-X)
Drills, Orient	2	(Fig. 63 Q, GG)
Netsinker	1	(Fig. 64 H)
Scrapers	2	(Fig. 63 R)
Teshoas	2	
Spalls: Jasper 363, Flint 156, Chert 103, Argillite 45, Chalcedony 4		
Ground Stone		
Celt	1	(Fig. 64 E)
Altered by Usage		
Grinding Stones	2	
Muller, Pitted	1	(Fig. 64 J)
Smooth Stone	1	
Other		
Soapstone Bowl Fragment	1	(Fig. 64 L)

A large irregular hearth filled with fire-spalled sandstone river cobbles is considered to be a single feature. Some of the Early Series pottery may belong to this component.

EARLY OR MIDDLE WOODLAND COMPONENT

Four flint side-notched points, three Rossville points (two are surface finds), a side-notched jasper knife, and some Early Series pottery may represent the Bushkill complex (Fig. 63 E-H). A jasper Meadowood-like blade might also belong to this postulated cultural expression (Fig. 63 I). These objects are from the tan alluvium above the Orient hearth, and they are not associated with any features. Since there is only minimal stratigraphic evidence for the position of this poorly known material, further comment is premature.

LATE WOODLAND

Identifiable Owasco rim sherds are found in the context of five storage and refuse-filled pits while Tribal pottery occurs in only one pit. Intermediate pottery, a Bainbridge Linear variant, is found in pit Feature 24, together with Owasco sherds. The Owasco component embraces the following:

Pottery

Sackett Corded	4	
Owasco Corded Punctate	3	(Fig. 85 M)
Kelso Corded Collar (1 variant)	2	(Fig. 74 C)
Milo Corded	1	
Bainbridge Linear (variant)	1	

Chipped Stone

Madison	3	(Fig. 63 B)
Levanna	1	(Fig. 63 C)
Abraded Stone	1	
Blank (triangular)	1	
Netsinker	1	(Fig. 64 I)
Scraper	1	

Spalls: Flint 34, Chert 33, Jasper 18, Argillite 12, Rhyolite 2, Chalcedony 2, Shale 1

Altered by Usage

Pitted Stones	5

Other

Bone Awl	1
Quartz Crystal	1
Burnt Chert	1

Only Feature 4, a basin shaped pit, contained Tribal rim sherds. The Tribal component contains the following:

Pottery

Deowongo Incised	1
Munsee Incised	1
Unidentified Tribal	3

Chipped Stone	
Madison	1
Spalls: Jasper 51, Flint 17, Argillite 4, Chert 2	
Ground Stone	
Pestle	1
Altered by Usage	
Rounded Stone	1

SUMMARY AND INTERPRETATION

The cultural sequence at the Brodhead-Heller site is established by stratigraphy and supported by radiocarbon analysis and typological considerations. The most significant archeological data are derived from a small deeply excavated plot measuring 40 feet by 30 feet. Three major components, Delaware Valley Archaic complex, Perkiomen, and Orient are present. Four minor components, unnamed (consisting of Normanskill-like points), Early or Middle Woodland, Owasco, and Tribal were identified. Paleo-Indian, Bushkill, and other components may be recognized from surface finds with the latter also having a subsurface context.

LATE ARCHAIC

The earliest and deepest component in the stratified sequence is a phase of the recently recognized Delaware Valley Archaic complex. It is a local Late Archaic complex embracing a variety of perhaps five or six distinctive projectile point types. Locally derived shale and argillaceous shales are the preferred lithic materials and these are diagnostic for the complex.

At this site the majority projectile point type for the Delaware Valley Archaic complex component is the Lackawaxen Expanded Stem subtype. Minority point types are variations of this type. There are two Egypt Mills points, a single straight-based form, and five MacPherson points. The MacPherson type is made of flint and is somewhat different, but it probably belongs to the component. The presence of a Brewerton Eared-Notched point suggests the possibility of contact between Brewerton groups and those of the local Lackawaxen phase. Stone tool traits resemble those common to other Late Archaic manifestations in the Northeast. These traits include adzes, celts, roughly chipped choppers and knives, mullers, and a spearthrower weight. Features are small and rock-lined.

Charcoal collected from one of these features, Feature 18, is radiocarbon dated at 1710 B.C. ± 120 years (Y-2342). This is interpreted

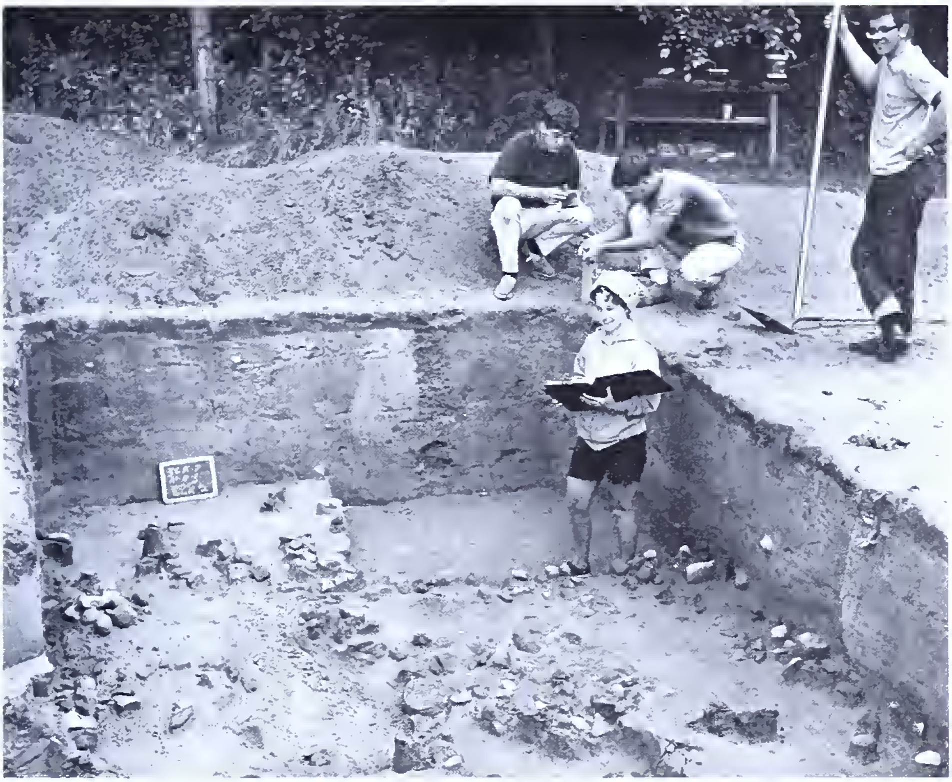


Fig. 65. EXCAVATION SCENE OF THE ORIENT HEARTH at the Brodhead-Heller site.

as a likely terminal date for the Lackawaxen component, since it is very close to the radiocarbon dates for the broadspear components found at this site and at other sites in the area. The postulated age range for the Delaware Valley Archaic complex is 3500 B.C. to 1700 B.C.

The Perkiomen component of the broadspear tradition is stratigraphically superior to the Delaware Valley Archaic complex. It is represented by a large (at least 30 by 20 feet) hearth of fire-spalled sandstone river cobbles. A majority of points are the distinctive Perkiomen broadspear of jasper, while Lehigh/Koens-Crispin and Susquehanna broadspears are present as minority types. It is impossible to determine if the minority types are in fact an intrinsic part of this component. Other stone tool items include scrapers (made from broken broadspears), drills, adzes, rough cutting and chopping tools, abrading stones, grinding stones, and hammerstones. McNett (1967: 28-30, Fig. 6) has previously noted that the utilization of jasper spalls is a Perkiomen trait.

Charcoal from the Perkiomen hearth yielded the date 1620 B.C. ± 100 years (Y-2340). This is considered as a middle date for Perkiomen. A span of 200 years, 1700 B.C. to 1500 B.C., is the postulated range for the broadspear tradition in the Delaware Valley.

The contrast between the late Delaware Valley Archaic complex and the later broadspear components is reflected in the different diagnostic projectile point types, lithic preference, skill in execution and production of chipped stone tools, and feature size. It is suggested that a dramatic change was produced by socio-economic factors, which may indicate a population shift or a diffusion of culture traits. On the other hand there are factors which indicate the development of the broadspear tradition within the Late Archaic. A minor environmental change may have precipitated the adaptation to a riverine ecology with an accompanying shift in material culture. Possibly the hearth indicates community involvement in an activity such as the netting and preparation of fish. Shad, which still travel upstream each spring to spawn, might have been dried, cooked, or smoked on the hearth. Although netsinkers are not present in this Perkiomen component, these artifacts do occur in similar components at nearby sites. The absence of netsinkers is not considered a negative trait, but it is believed to be a factor of the limited sample size.

Very little is known about the unnamed component with the wide and deeply side-notched points. These Normanskill-like points show a faint resemblance to Orient and Dry Brook types. They could belong to a modified extension of the Normanskill phase coming under the influence of an early developmental stage of the Dry Brook phase. Feature 26, a rock-lined fireplace of this component, yielded a radiocarbon date of 1440 B.C. ± 100 years (Y-2341).

The Orient component is represented by a large hearth composed of fire-spalled sandstone river cobbles. This is assumed to be a single feature and it represents a continuation of traits introduced by the preceding broadspear tradition. The component has the similar Orient and Dry Brook projectile point types. Drills, scrapers, rough cutting tools or teshoas, netsinkers, celts, grinding stones, mullers, and soapstone bowls are other traits. Cord-marked pottery in a very small quantity is possibly another trait, although the evidence is equivocal. Charcoal collected from the Orient hearth (Fig. 65), is radiocarbon dated at 1170 B.C. ± 120 years (Y-2339). The date is considered as early Orient. The fishtail tradition has a time span of 500 years ranging from 1300 B.C. to 800 B.C. in the Delaware Valley.

EARLY TO MIDDLE WOODLAND

Unnamed side-notched points, a Meadowood-like jasper blade, and a small quantity of cord-marked and stamped pottery provide evidence for a minor component, although it is possible some of the pottery may pertain to the Orient/Dry Brook component. Evidently this occupation was of brief duration, and the remains are too sparse and too poorly known for further comment.

LATE WOODLAND

Due to the restricted size of the excavation plot, little was revealed of the Late Woodland components. The Owasco occupation is limited to five refuse-filled pits and a probable circular house with an estimated diameter of 25 feet. Five Owasco pottery types and a variant of Bainbridge Linear, together with triangular points and some nondiagnostic material comprise the list of Owasco traits. The estimated date for this component is about A.D. 1350.

The Tribal component is represented by one refuse-filled pit feature, two incised pottery types, a triangular point, and a few nondiagnostic stone artifacts. The estimated date for this component is A.D. 1400 to 1450.

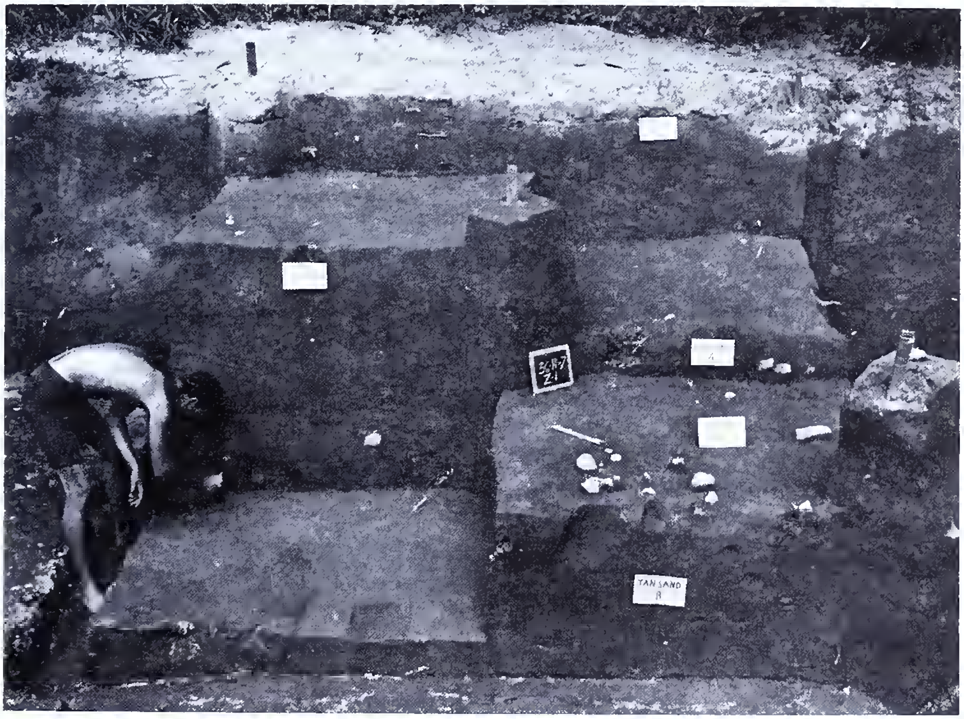


Fig. 66. GENERAL EXCAVATION SCENE AT THE BRODHEAD-HELLER SITE showing the various stratigraphic levels.

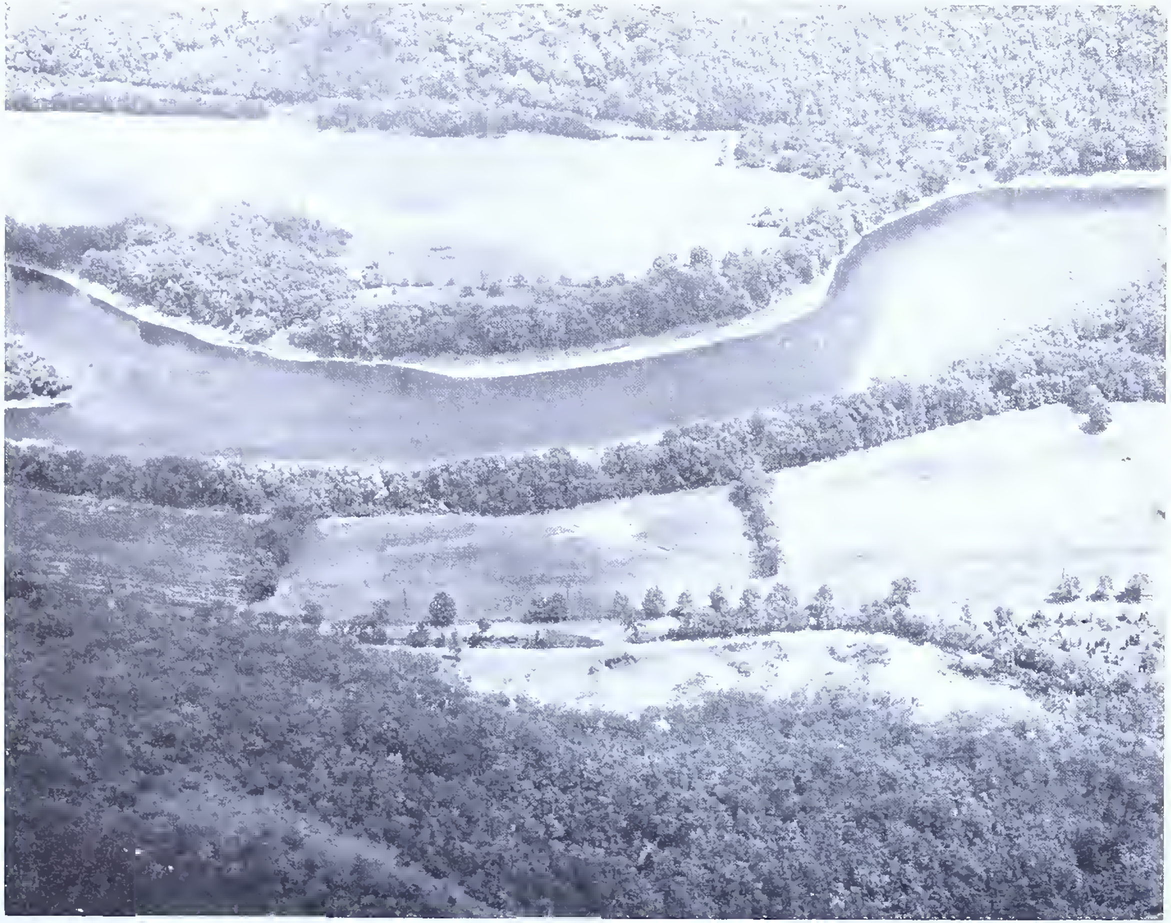


Fig. 67. AERIAL VIEW OF THE EGYPT MILLS SITE.

Egypt Mills Site

36-Pi-12

INTRODUCTION

THE EGYPT MILLS site is the property of the Egypt Mills Club, a private fishing and hunting club. The caretaker, Jack Van Horn, kindly gave permission to conduct the archeological investigations which took place in the third field north of Toms Creek opposite a high and steep shale bank (Fig. 67). Four other sites were found in nearby fields belonging to the club. The Egypt Mills site is located at 41 degrees, 07 minutes, and 40 seconds north latitude and 75 degrees, 56 minutes, and 50 seconds west longitude, which is about three miles north of Bushkill, Pennsylvania. It is situated on the lowest terrace, about 40 feet above normal water level.

At the time of the excavations the site was overgrown with weeds, but in the past the area had been farmed and these several fields are well known to local collectors for surface hunting. One hundred and forty man-days were spent excavating the site from July 8 to August 10, 1965, and an area of 3,900 square feet or 156 five-foot squares was uncovered. Sixty-seven squares were excavated by three- and six-inch levels to varying subsurface depths. A deep test pit was hand dug to a depth of 12 feet which confirmed that the cultural deposits were shallow and compacted into a homogenous soil profile.

FEATURES (FIG. 68)

Features at the Egypt Mills site were not very helpful in the interpretation of the archeological manifestations. Only 17 features were present, 11 of which were roughly circular stained areas. In cross section they were shallow and saucer-shaped. Three of these features were hearths containing charcoal and fire-cracked rock. Diameters were 18 inches, 30 inches, and 40 inches, while depths were 6 inches, 10 inches, and 18 inches respectively. The remaining nine features or disturbances were of similar size, shape, and character. It is uncertain whether they functioned as firepits. There were six distinct man-dug pits, one of which contained freshwater mollusk shells.

There was also a quantity of fire-cracked rock from a hearth which had been disturbed and scattered by plowing.

With few exceptions, cultural materials were found distributed

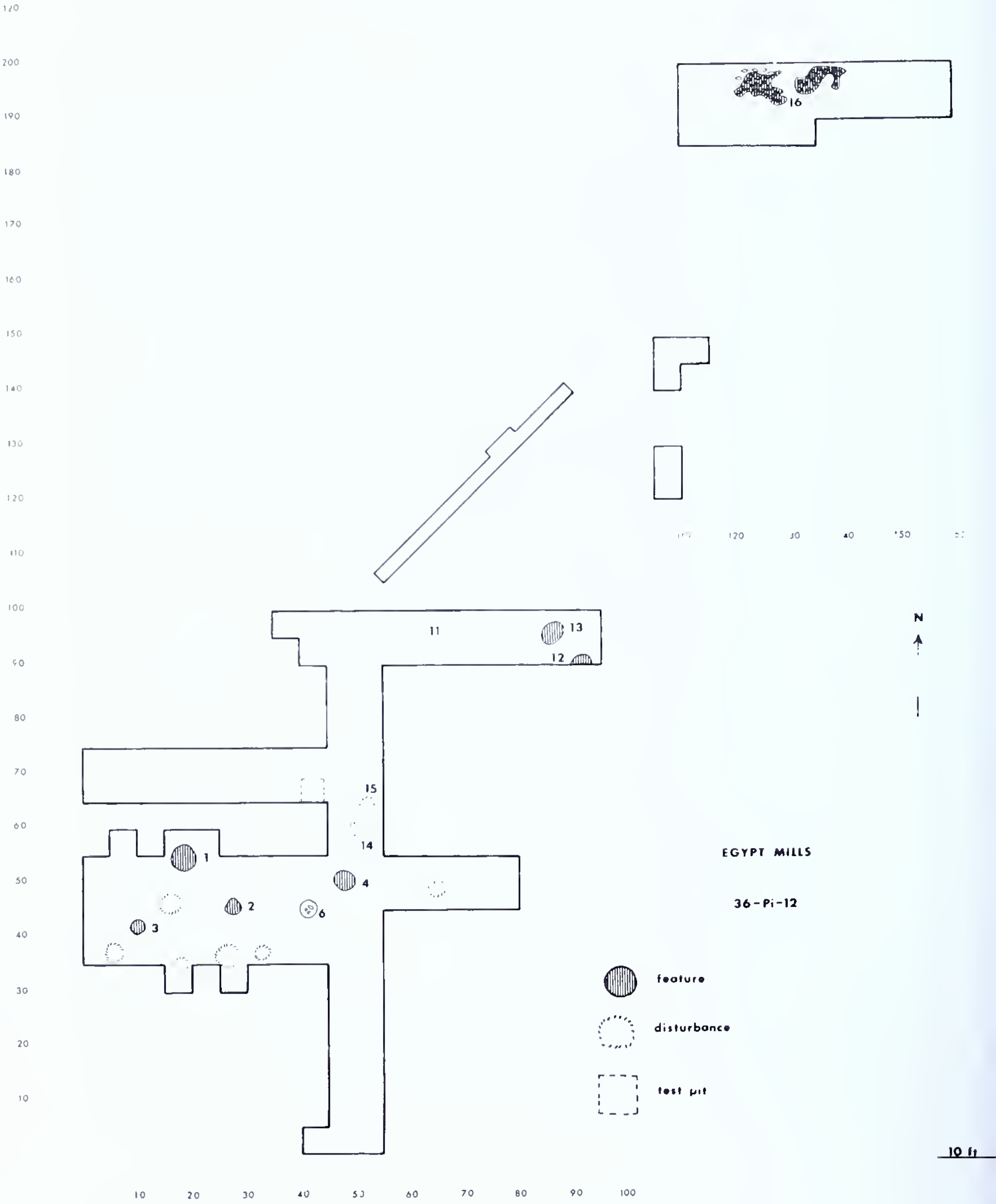


Fig. 68. EXCAVATED AREA OF THE EGYPT MILLS SITE.

throughout the various levels and not in the context of features. Nine features were sterile and very few items were found in the other eight. Usually artifacts from features were not diagnostic enough to attach any significance to the association. No postmolds were present and no charcoal sample was satisfactory for radiocarbon dating.

Historic Materials

Eighteenth- or nineteenth-century activities are noted by the presence of five kaolin pipe stem fragments found in the topsoil. John L. Cotter examined the fragments and (based upon Harrington's estimates, October 22, 1968, personal correspondence) determined:

Two stems with a 6/64-inch hole diameter from Square N50W30

Dates	
1650 to 1680	17% possibility
1680 to 1710	70% possibility
1710 to 1750	12% possibility

Three stems with a 5/64-inch hole diameter from Square N100E70

Dates	
1680 to 1710	10% possibility
1710 to 1750	70% possibility
1750 to 1800	10% possibility

These pipe fragments are likely discards of early settler-farmers, and they are the only vestiges of the historic period in this field, although some other historic material has been found on the surface near the mouth of Toms Creek. There is the possibility that there were two very minor historic occupations represented by the pipes: 1680 to 1710 and 1710 to 1750.

Pottery

Pottery was extremely scarce and unimportant, with only 34 small body sherds and no rim sherds present. Eleven sherds are corded while the others have a smooth surface. A trace of incising occurs on one sherd. Ten sherds are from the levels between 6 inches and 18 inches and the remainder came from the topsoil. The ceramics suggests the presence of minor Owasco and/or Tribal components.

Stone Artifacts

Projectile Points—46

The projectile point series from the Egypt Mills site shows a diversity of eight types. They conform to types found elsewhere in the

Upper Delaware Valley. One new Archaic type, the Egypt Mills point, is established on the basis of evidence from this site and others.

Early Woodland

Orient—2 (Fig. 69 A)

Lithic preference

Flint	1
Chert	1

Late Archaic

Normanskill—3 (Fig. 69 B)

Lithic preference

Argillaceous Shale	2
Flint	1

	Length (inches)	*Width*	*Thickness*
Range	2.48-1.90	.93-.69	.31-.22
Average	2.23	.84	.27

(based upon 3 specimens)

Normanskill-like—3 (Fig. 69 D)

Lithic preference

Argillaceous Shale	3

	Length (inches)	*Width*	*Thickness*
Range	2.05-1.72	.97-.84	.32-.23
Average	1.92	.90	.28

(based upon 3 specimens)

Brewerton Side-Notched—1 (Fig. 69 E)

Lithic preference

Chert	1

Length (inches)	*Width*	*Thickness*
1.30 (estimate)	.81	.25

(based upon 1 specimen)

Lamoka-like—7 (Fig. 69 F)

Lithic preference

Argillaceous Shale	3
Flint	2
Chert	1
Argillite	1

	Length (inches)	*Width*	*Thickness*
Range	1.80-1.09	.96-.67	.35-.22
Average	1.51	.78	.28

(based upon 7 specimens)

Late Archaic—Delaware Valley Archaic Complex

Lackawaxen Stemmed—Straight Stem Subtype—5 (Fig. 69 C)

Lithic preference

Argillaceous Shale	4
Siltstone	1

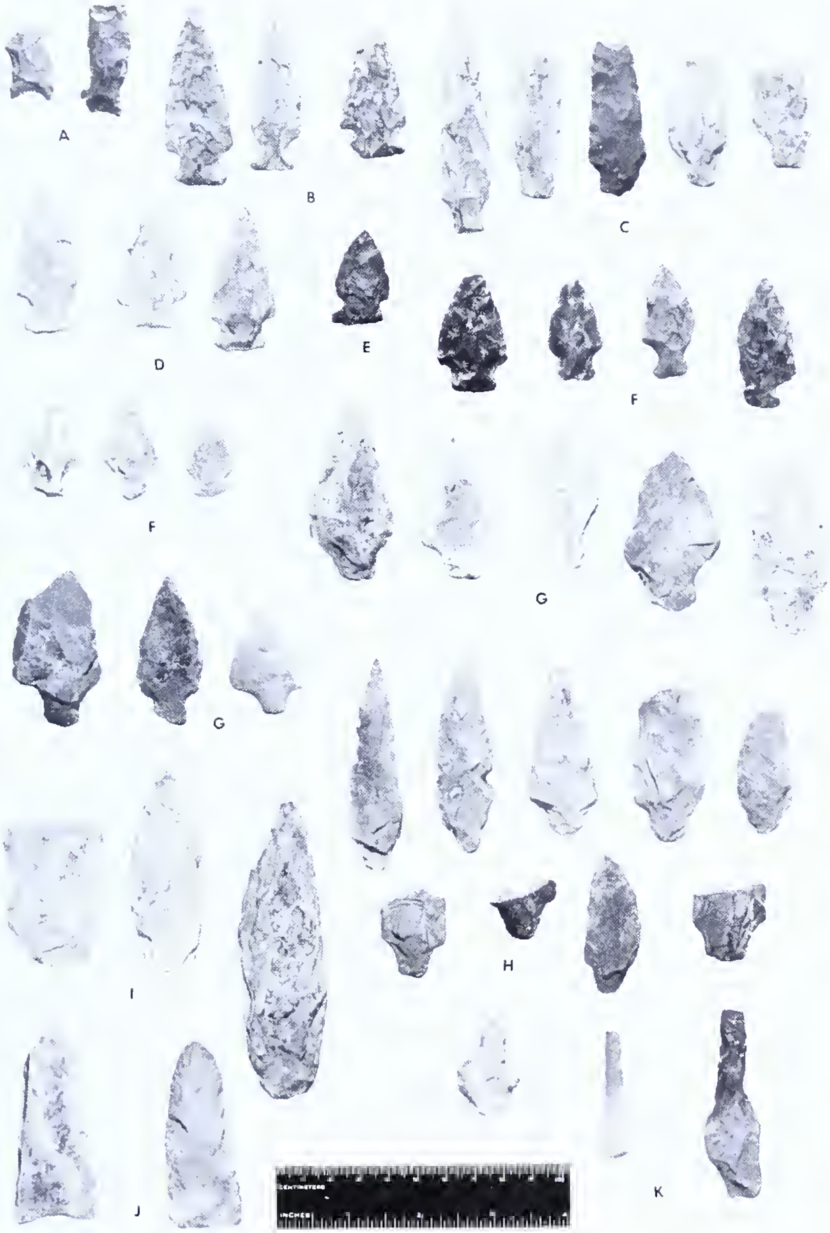


Fig. 69. PROJECTILE POINT TYPES, KNIVES, AND DRILLS from the Egypt Mills site: A, Orient points; B, Normanskill points; C, Lackawaxen Straight Stem subtype points; D, Normanskill-like points; E, Brewerton Side-Notched points; F, Lamoka-like points; G, Egypt Mills points; H, Lackawaxen Converging Stem subtype points; I, large ovate knives; J, trianguloid knives; K, drills.

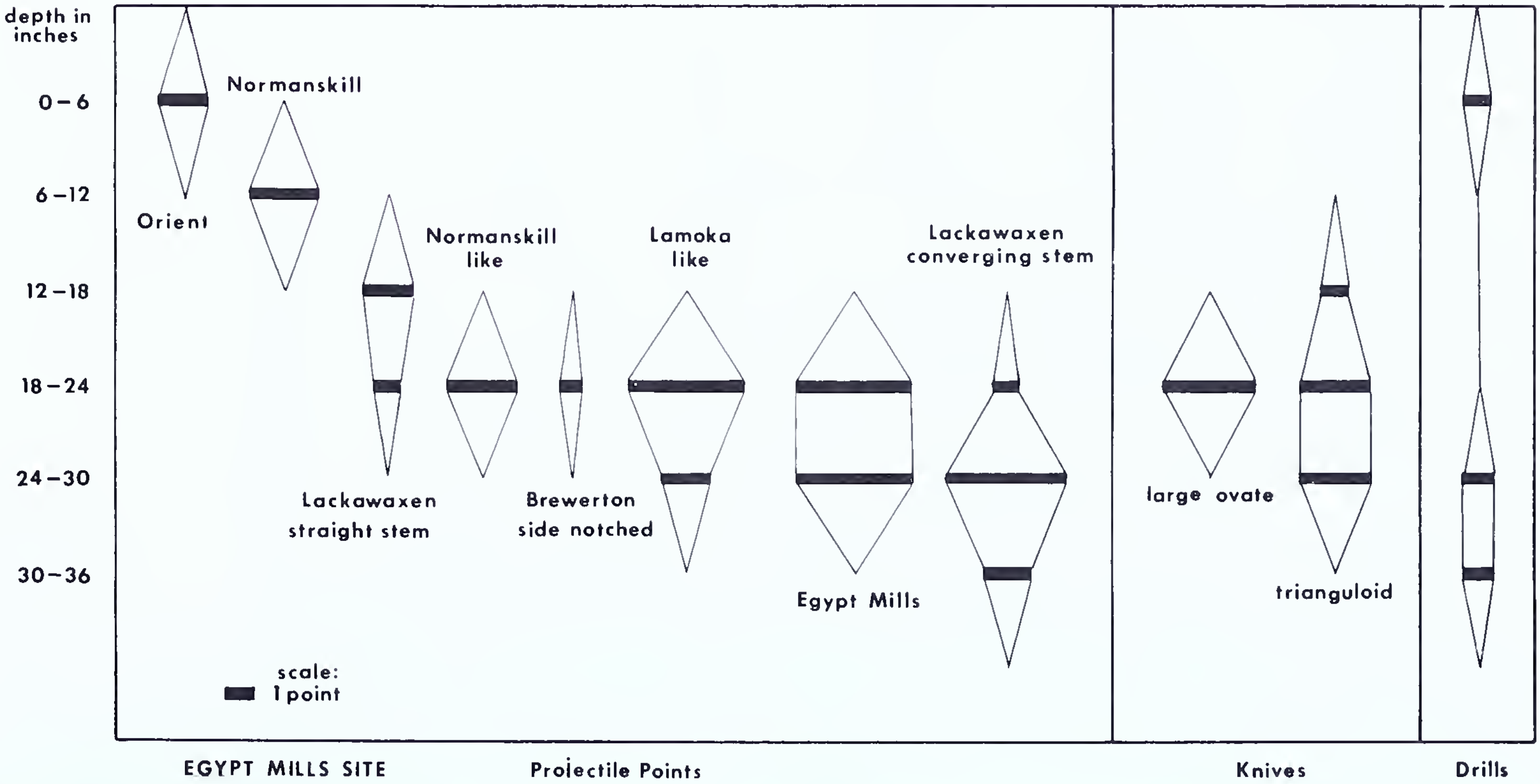


Fig. 70. SERIATION OF THE PROJECTILE POINT TYPES, KNIVES, AND DRILLS from the Egypt Mills site.

Length (inches)	*Width*	*Thickness*
3.20	.69	.29

(based upon 1 specimen)

Lackawaxen Stemmed—Converging Stem Subtype—9 (Fig. 69 H)

Lithic preference

Shale	7
Flint	2

	Length (inches)	*Width*	*Thickness*
Range	2.97-1.80	1.00-.73	.31-.24
Average	2.36	.81	.27

(based upon 5 specimens)

Egypt Mills—8 (Fig. 69 G)

Lithic preference

Shale	4
Argillaceous Shale	4

	Length (inches)	*Width*	*Thickness*
Range	2.75-1.50	1.33-.86	.37-.21
Average	2.16	1.09	.27

(based upon 8 specimens)

There are also 14 tips and midsections too fragmentary for classification.

OTHER STONE TOOLS

Chipped

Projectile Points (including 14 tips and fragments)		52	
Knives		17	
Large Ovate	6		(Fig. 69 I)
Trianguloid	8		(Fig. 69 J)
Other	3		
Large Crescent-Shaped Knife		1	(Fig. 71 G)
Drills		3	(Fig. 69 K)
Teshoas		5	
Netsinkers		2	
3 Cores, Spalls: Shale/Argillaceous Shale 182, Flint 113, Jasper 98, Chert 34, other 51			
Total		80	
or 82.5% of the sample			

There are two knife forms, ovate and trianguloid. The former has convex blade edges and a rounded base. Very little trimming of the lower blade edges would be required to transform these knives into either Lackawaxen Stemmed or Egypt Mills point types. An average specimen measures 2.82 inches long and .90 inches wide. The trianguloid knives tend to have straight blade edges and a straight base with rounded corners. These are smaller than the ovate form; a typi-

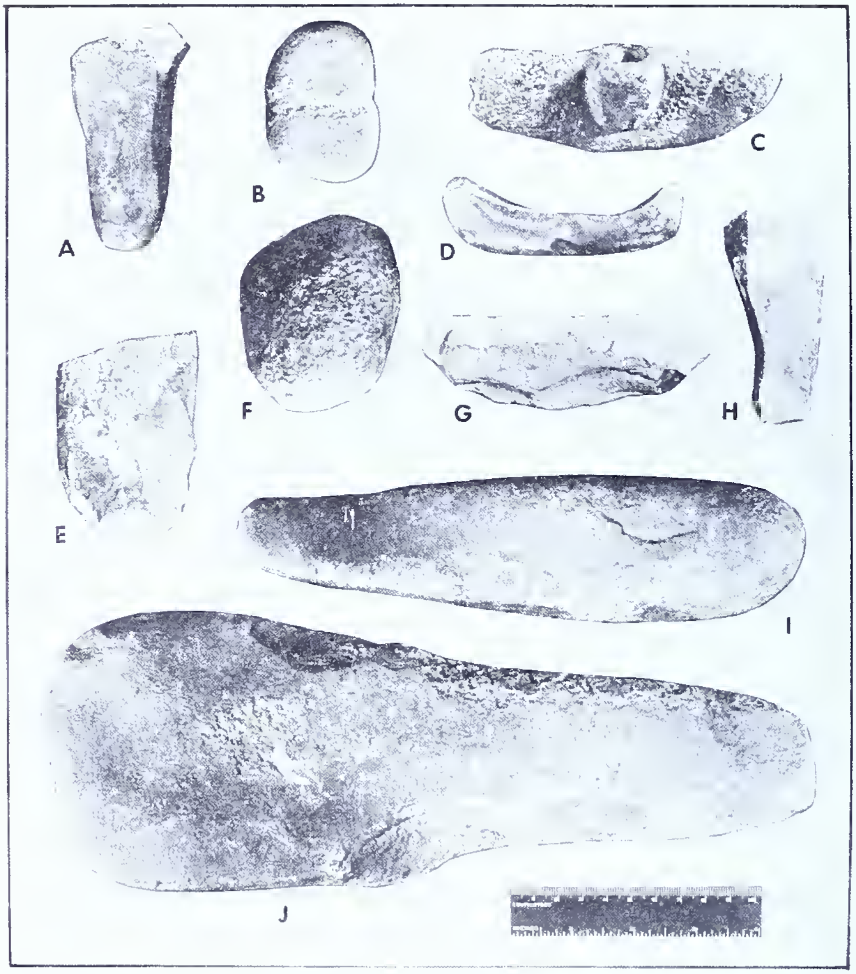


Fig. 71. POLISHED, GROUND, AND CHIPPED STONE ARTIFACTS from the Egypt Mills site: A, abrading stone, topsoil, shale; B, bola stone, 12″-15″, sandstone; C, unfinished spear thrower weight, topsoil, metamorphosed shale (?); D, abrading stone, 18″, shale; E, adze blank, topsoil, shale; F, hammerstone, 20″-22″, shale; G, crescentic knife, topsoil, shale; H, celt bit, surface, granite; I, unfinished pestle, 14″-20″, siltstone; J, unfinished pestle, 31″, siltstone.

cal example measures 1.87 inches long and .77 inches wide. Other knife forms are too fragmentary for classification. With one exception all knife specimens are made of shales.

A large crescent-shaped knife measures 4.67 inches long and 1.50 inches wide, and except for the fact that this knife is made of shale, it resembles the slate ulu which is found in certain Archaic complexes in New York and New England.

Ground and Pecked

Pestles		3	
Unfinished	2		(Fig. 71 I, J)
Broken	1		

Celts	2	(Fig. 71 H)
Spearthrower Weight (unfinished)	1	(Fig. 71 C)
Bola Stone	1	(Fig. 71 B)
Total	**7**	
or 7.2% of the sample		

Altered by Usage

Mullers		3	
Plain Muller	1		
Mullers (used as hammers)	2		
Hammerstones		2	
Milling Stones		2	
Multipitted Stone		1	
Abrading Stones		2	(Fig. 71 A, D)
Total		10	
or 10.3% of the sample			

A large milling stone has been subject to heavy percussion blows along the edge, resulting in the removal of large spalls from the periphery. A multipitted stone has five distinct pits, and it has been heavily battered on one surface.

The chipped-stone category embraces the largest number of artifacts, with projectile points and knives the most common tools. Implements used for the preparation of wild foods or the cutivation of crops are a minority. The former are generally associated with hunting activities.

Associations

Most of the cultural materials were found in the several arbitrary excavation levels of what were once living surfaces. There has been little increment of soil over the millenniums, and there is no perceptible differentiation of occupational zones caused by human activities. The several components are compressed into a compact and uniform soil profile. Vertical distribution of projectile point types and knives by arbitrary six-inch levels is revealed on Figure 70. However, the data on this graph derive from statistical evidence.

Side-notched types, Orient, Normanskill, Normanskill-like, and Brewerton Side-Notched are not found below the 24-inch level. The latter three types have their greatest frequency in the 18- to 24-inch level, with Normanskill-like points also occurring in the immediately superior level. These three types were also found within an 18-foot horizontal radius. The Orient and the Normanskill points were found in the uppermost levels, with the latter type distributed within a 12-foot radius. A single Brewerton point was found in the 18- to

24-inch level, while Lamoka-like points occur in that level and the next deeper level. The Brewerton point and several of the Lamoka-like points were within a radius of about 17 feet, in the north central portion of the excavation plot.

The Lackawaxen Straight Stem subtype has an interesting occurrence pattern in that it is the only projectile point type found in the 12- to 18-inch level. The horizontal distribuiton of this type places three examples within a seven-foot radius, while all specimens were encompassed inside a 20-foot radius. The similar and related Lackawaxen Converging Stem subtype was found in the deepest levels, and it was the only type in the 30- to 36-inch level. This type was not found above the 18- to 24-inch level and it appears to be the earliest point type at this site and it is distributed over the entire site plot. The broad-bladed Egypt Mills point was found in only two levels, 18 to 24 inches and 24 to 30 inches. The horizontal distribution of the Egypt Mills point can be traced at scattered intervals along a 45-foot northeast to southwest line.

The trianguloid knives tend to be found deeper in the site than the ovate form. Accordingly, the Lackawaxen Converging Stem points and the trianguloid knives tend to be associated, while the larger ovate form may be the knife form of the Egypt Mills point type.

Table 8. Lithic preference by levels.

Level	*Flint*		*Jasper*		*Chert*		*Shale/ Argillaceous Shale*		*Other*		***Totals***
Inches	*No.*	*%*	*No.*	*%*	*No.*	*%*	*No.*	*%*	*No.*	*%*	*No.*
6-12	5	16.7	11	36.7	9	30.0	3	10.0	2	6.6	30
12-18	17	30.6	8	14.2	5	8.8	15	26.7	11	19.7	56
18-24	38	22.2	22	12.9	12	7.0	81	46.7	18	10.2	171
24-30	47	23.9	47	23.9	8	4.1	76	38.5	19	9.6	197
30-36	6	21.5	10	35.8	—	—	11	39.6	1	3.6	28
Total	113	23.4	98	20.3	34	7.2	186	38.6	51	10.5	482

Table 8 shows lithic preference by level of spalls and chipped stone artifacts. Spalls from igneous and sandstone rocks used primarily in the production of heavy stone tools are not included. Overall, shales and argillaceous shales are the most popular lithic material, followed by flint and jasper, with the former showing a distinct plurality over flint and jasper in the three deeper levels. Shale is even more common than jasper at the 12- to 18-inch level, while jasper and chert are preferred in the first level. Chert decreases sharply in the lower levels and is absent below 30 inches.

Although a number of jasper spalls show retouching along one edge, a single broken and untyped projectile point is the only finished artifact fashioned from this material. It is rather curious that one-fifth of the lithic material is jasper, but only one finished specimen is made of this material. Since jasper had to be transported to the site, it is felt that the raw material was brought to the area and that the finished tools were made locally. At other sites in the Tocks Island Reservoir, workshop areas with large quantities of jasper flakes are a trait of Orient and Perkiomen components. The excavations failed to uncover any evidence for a Perkiomen component and only slight evidence of an Orient one, but it is likely that more extensive excavations would have yielded additional data pertaining to these two manifestations. In contrast to this use of jasper, shale and argillaceous shale are not commonly used elsewhere in the Northeast for the manufacture of chipped stone tools. The use of the latter in some quantity reflects the utilization of the numerous nearby shale outcrops by Indians of the Delaware Valley Archaic complex.

Other than projectile points, stone tools are present in limited numbers and many of these are non-diagnostic. Unfortunately, the more diagnostic items are often from the surface or the topsoil so that it is difficult if not impossible to determine just what the associations are. This situation occurs for a spearthrower weight, a bola stone, a crescent-shaped knife, a spalled milling stone, a hammerstone, and a teshoa. Only a few items remain which provide hints of valid associations.

Three pestles were found in levels corresponding with all point types except for Orient and Normanskill. A more meaningful association is the occurrence of a pestle in the same level and square (30- to 36-inch level) with a Lackawaxen Stemmed point of the Converging Stem subtype.

A netsinker occurred in the 12- to 18-inch level, which is the major level for the Lackawaxen Straight Stem points, but this locus shows no horizontal relationship to these points. A teshoa or chopper was found within about five horizontal feet of a single specimen of this point type.

No additional comments regarding vertical and horizontal distribution seem to be pertinent except to note that three drills were found, on the surface, in the 24- to 30-inch level, and in the 30- to 36-inch level. The drill from the deepest level is reworked from a point of the Lackawaxen Converging Stem subtype.

INTERPRETATIONS

The Egypt Mills site is primarily a multicomponent manifestation of the Late Archaic. The site contains a veneer of material culture of the seventeenth and eighteenth centuries, as well as slender evidence for Late Woodland occupations. These cultures left only a few familiar imprints at the site. A similar situation holds for an Orient occupation.

Limitations of the archeological knowledge of the local Late Archaic do not permit an accurate and positive determination of the number of Archaic components present at this site. A compact stratigraphic profile together with limited evidence of horizontal associations and the lack of features inhibits making a definitive statement on the data. If it is assumed that single diagnostic projectile point types represent a component and that these are valid types, then seven Archaic components are present. However, this tends to be an overly restrictive view which does not allow for possible functional differences and the possible simultaneous utilization of two closely related projectile types. Carried to its extreme, this hypothesis does not take into consideration possible variations based upon the skill of the maker or upon personal idiosyncrasies, nor differences caused by the characteristics of different lithic materials.

Although the Late Archaic in the Northeast is represented by a variety of projectile point types, it seems unlikely that as many as seven components of this period are present at the Egypt Mills site. In broader terms, two projectile point complexes are discernible. One complex has stemmed points with relatively long and narrow blades and includes the Lackawaxen Stemmed type (Straight and Converging Stem subtypes) and the related broad blade form, the Egypt Mills point. These types represent part of the local indigenous Late Archaic, and the term Delaware Valley Archaic complex is suggested as an appropriate name for this manifestation. At nearby local sites, other projectile point types not found at the Egypt Mills site occur as part of this complex. It is theorized that future archeological studies will recognize several phases within this complex, and these will be identified largely by related and diagnostic projectile point types.

The chipped stone tools of the Delaware Valley Archaic complex are made almost exclusively of local shales and argillaceous shales. The major projectile point form is the long and slender Lackawaxen Stemmed point with three subtypes. The Expanded Stem subtype is absent from this site. A minor type, the Egypt Mills point, which is related to the Lackawaxen Stemmed point, is a local expression of the Late Archaic broad blade form. Other traits are ovate and trianguloid knives, drills, spearthrower weights, pestles, mullers, milling stones, netsinkers, heavy rough choppers or teshoas, and hammerstones. The more diagnostic traits are illustrated on Figure 69 C, G-K.

The second complex is composed of relatively long and narrow blade projectile points with side notches. Except for the Egypt Mills point, these projectiles have a slightly greater blade width to length ratio than those of the Delaware Valley Archaic complex. This group compares with similar complexes from the Hudson Valley and it includes Normanskill, Normanskill-like, and Lamoka-like points. The Lamoka-like points intergrade with certain types in both groups, and they resemble Lamoka-like points from the Hudson Valley (Funk 1965: 147, Fig. 3) and from the Farrell Farm site in western New York (Hayes: February 5, 1969: personal correspondence). The former are radiocarbon dated 2210 B.C. ± 140 years and at the latter site they date 2030 B.C. ± 160 years and 1940 B.C. ± 120 years. (Refer to the Appendix for additional information on these points.)

Possibly the Brewerton Side-Notched point (Fig. 69 E) is a cross-cultural trait, a trade piece, or a stray which could have occurred in either or neither complex. The non-diagnostic traits assigned to the Delaware Valley Archaic complex are obviously shared and could just as easily be assigned to the Hudson Valley group.

The hypothesis is advanced that the two complexes are participants in a stemmed non-Laurentian projectile point tradition. The local Delaware Valley Archaic complex is in part contemporary with Normanskill, Normanskill-like, and Lamoka-like complexes of the Hudson Valley. This local manifestation is believed to occupy a long time span, perhaps for as long as 1,800 years extending from 3500 B.C. to 1700 B.C. A date for the Brodhead-Heller site suggests the latter part of the range, while a date from the Faucett site is offered as the earlier date. Its greatest popularity probably occurs toward the latter end of the range.

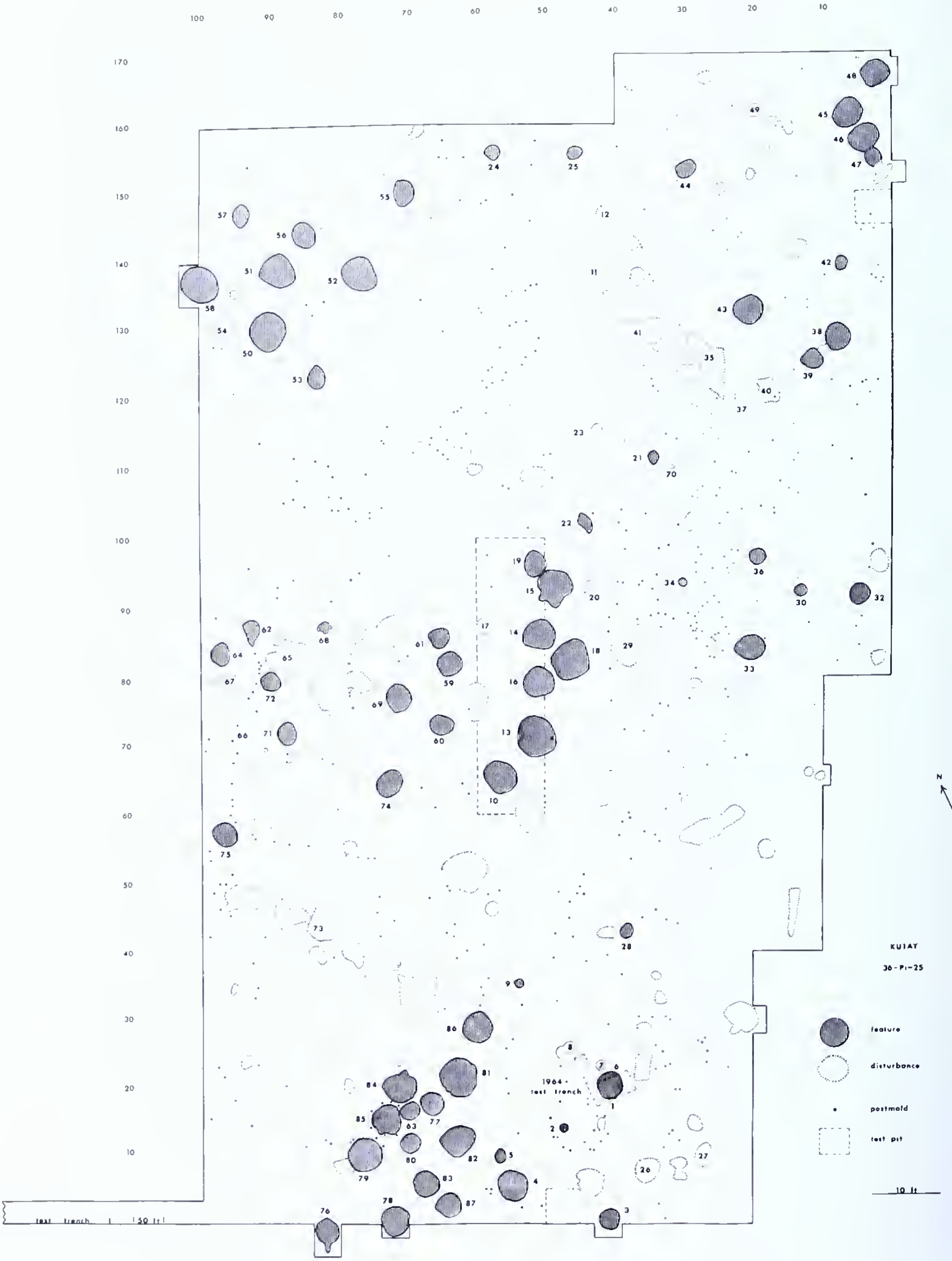


Fig. 72. EXCAVATED AREA OF THE KUTAY SITE.

Kutay Site

36-Pi-25

INTRODUCTION

THE KUTAY site, 36-Pi-25, is the property of Joseph Kutay, Bushkill, Pennsylvania, and is two miles north of the village between Route 209 and the Delaware River. It can be located at 41 degrees, 07 minutes, and 18 seconds north latitude and 74 degrees, 57 minutes and 55 seconds west longitude. The site is situated on the first terrace of the flood plain about 25 feet above normal water level.

One hundred and fifty-five man-days were spent excavating the site from June 10 to August 10, 1967. One hundred and fifty-two adjacent 10-foot squares with minor extensions to accommodate features located along the perimeter of the excavation plot, and 303 feet of trenches were excavated. Topsoil-removal operations in 1967, 1968, and 1970 have destroyed most of the remaining portion of the site. Three test squares were deeply excavated to determine if deeper occupational levels were present. Two were hand-dug test squares (5 x 5 x 4½ feet and 5 x 5 x 11 feet), and one was a large test trench (40 x 10 x 10 feet) dug by a bulldozer. No deep occupations were found. Numerous narrow red bands occur in the flood plain alluvium, and these are widely distributed throughout the site. Similar bands are present in the soil profile of most sites in the Upper Delaware Valley. These are distinct reddish-brown bands alternating with lighter brown sediments of similar lithology. Clearly, the bands are the result of natural phenomena and are not occupational levels. The bands are produced in the underlying B horizon by a concentration of iron oxides and iron oxide-coated clay minerals leached from the overlying alluvium or A horizon. (For a more detailed description refer to pages xiii-xvi in the Introduction.)

Soil samples analyzed for acid content produced the following pH values: topsoil 6.8, subsoil 6.8, and deep sandy alluvium 6.8. This indicates almost neutral soil conditions at all levels.

FEATURES (FIGS. 72, 76, 77)

One hundred and sixty-five features were encountered. Of these 72 were intentionally prepared pits while 93 were various types of disturbances. Some were rodent burrows. Others were relatively minor stains caused by fire and the offal of human habitation. Disturbances were given numbers on the excavation plot only when they contained artifacts, but generally they were sterile. Pits include the following types: bell (18), saucer (10), cone (4), shallow cone (5), basin (7), deep basin (19), and small pits (9) which were not considered important enough to warrant making profile drawings.

Although a large majority of the pits and features contain charcoal and often a number of pieces of fire-cracked rock, none are distinct hearths or fireplaces containing concentrations of ash, burned soil, or a large mass of fire-cracked rock. Presumably, some pits served as fireplaces. Middens and burials are absent. Twelve pits contained shell refuse. A total of 13 pits was found to be sterile.

There were 490 postmolds but no discernible patterns were observed. Several relatively straight lines seem to be formed by certain postmold patterns which intersect other straight lines to form right angles, or possibly corners. Arcs are also present, but none of the configurations forms a convincing house pattern.

Feature 85 is a sterile, deep, basin-shaped pit having steep sides and measuring 51 inches wide by 36 inches deep. Eight postmolds are evenly spaced around the perimeter of the feature. This trait has been recorded elsewhere in the Upper Delaware Valley. At the Camp Miller site postmolds around a hearth are believed to represent a food drying rack, while at the McCann site a similar ring of postmolds is considered an enclosure around a storage pit. This trait at the Kutay site resembles the latter.

During the investigation of the Kutay site, it was often possible to predict accurately where pits would and would not be located. The distribution of pits suggests that there are distinct groups of these features. Four clusters or groups of pits are discernible, and while not all the pits occur within the four clusters, the majority do. Based upon what may be arbitrary determinations, 18 pits are grouped in the southern portion of the site, 17 are grouped in the center, 9 occur in the northwest, and 8 in the northeast part of the plot.

Each of the four clusters (Fig. 72), has a width of about 35 feet. Only the center cluster occurs wholly within the excavation plot and provides reasonably accurate measurements of its dimensions. This cluster has an estimated length of 60 to 70 feet. These four clusters are about half as wide as they are long, and they are generally aligned along a northwest to southeast axis. Although width is greater in proportion to length than usual for early Iroquois longhouses, one may speculate that this distribution of pits represents internal storage, cooking, and refuse arrangements within four rectangular longhouses.

POTTERY (FIGS. 73; 74 D, E)

Pottery excavated at the Kutay site is remarkably uniform. Nearly all of it is considered Tribal (incised) and can be ascribed to a single component. (Refer to the pottery Appendix for descriptions of pottery types and for an explanation of the term Tribal in reference to late incised pottery.) Chance phase types are based upon Lenig (1965). Two Owasco pottery types, Kelso Corded and Milo Corded, are the earlier pottery types found at the site. There is also one example of Bainbridge Linear.

An unusual stylistic variation on the established Chance phase types was discovered as a result of topsoil-removal operations carried out during the summer of 1968, a year after the archeological excavations had taken place. Beginning about 100 feet north of the northern perimeter of the original excavation plot along the slight rise of the 355-foot contour line, Robert Vandercar, Bushkill, encountered a series of pits. Most of the material salvaged from this area conforms to the excavated assemblage. There were an undetermined number of pits containing food preparation implements, a few triangular points, incised pottery, and the remains of freshwater mollusks.

Several sherds are of interest because of the subdivision of the main decorative motif with incised isosceles triangular patterns (Fig. 73 I, K). This style is a variation on Deowongo Incised and foreshadows Munsee Incised. An Oak Hill Corded rim sherd was also recovered from this area (Fig. 73 D).

The excavated pottery shows a few variations, including the small Chance vessel (Fig. 74 D) with shallow punctates used to emphasize the border between triangular plats. Another vessel (Fig. 74 E) is considered a variant form of Abbott Zoned and is included within the Tribal Series.

The following is an estimate of the number of whole vessels and the several types represented by rim sherds sufficiently intact for certain identification. Where it seemed likely that two or more rim sherds were from the same vessel, they were tabulated as a single vessel. If a sherd exhibited the basic elements of Chance phase pottery but was too fragmentary for positive determination as to specific type, it was classed as unidentified Tribal. Neither sherds located as

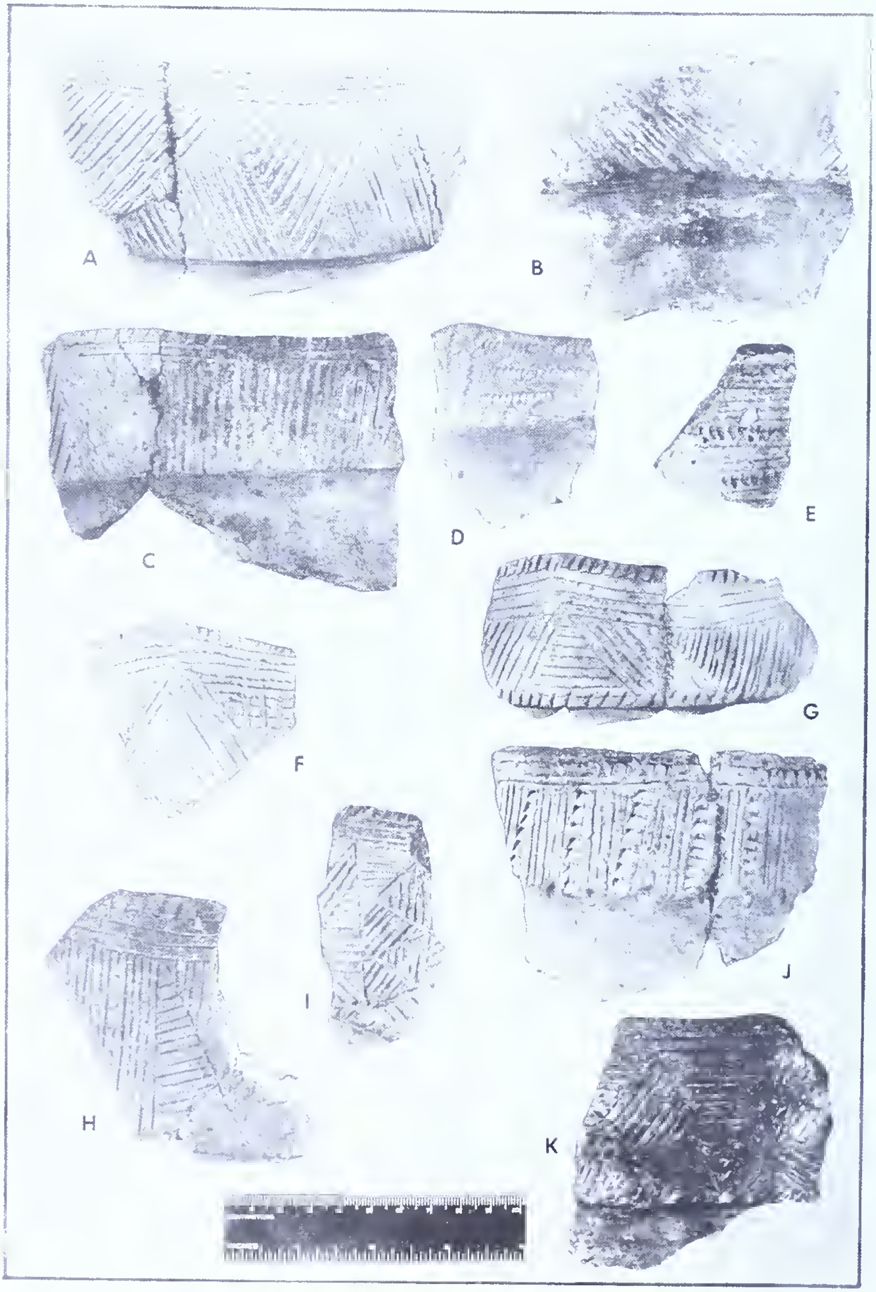


Fig. 73. TRIBAL AND OAK HILL POTTERY FROM THE KUTAY SITE: A, Chance Incised, Feature 26; B, Chance Incised, Feature 50; C, Chance Incised, Feature 13; D, Oak Hill Corded, salvage; E, unidentified Tribal, Feature 78; F, Munsee Incised (possible), Feature 3; G, H, Deowongo Incised, Feature 75; I, Deowongo Incised (variant), salvage; J, Garoga Incised (variant), Feature 15; K, Deowongo Incised (variant, Munsee-like), salvage.

a result of the 1968 topsoil removal nor small unidentified excavated fragments, which may possibly represent five additional vessels, were included in the percentage figures.

Type	*Estimated Number of Whole Vessels Based Upon Rim Sherds*		
Owasco			
Kelso Corded	1	3.9%	
Milo Corded	1	3.9%	
Intermediate			
Bainbridge Linear	1	3.9%	
Tribal			
Garoga Incised	8	30.7%	(Fig. 73 J)
Deowongo Incised	7	26.8%	(Fig. 73 G-I)
Chance Incised	5	19.1%	(Figs. 73 A-C; 74 D)
Durfee Underlined	1	3.9%	
Munsee-like	1	3.9%	(Fig. 73 F)
Abbott Zoned, Kutay variant	1	3.9%	(Fig. 74 E)
Unidentified Tribal	11		(Fig. 73 E)
Total	37		

Stone Artifacts

Projectile Points—9

Only nine projectile points were uncovered in the extensive excavations at the Kutay site. Seven are triangular points, of which five have the concave base characteristic of the Levanna point (Fig. 91 AAA, CCC-EEE). An unfinished triangular blade probably belongs to this type although it is broken at the base (Fig. 91 FFF). One of the triangular points has a deeply concave base and is proportionally longer and narrower than the others (Fig. 91 BBB). The lithic material also differs in that it is shale and the other points are of flint or chert. The smallest point in the series has a straight base and is more nearly an equilateral triangle of the Madison type. A tip and midsection are likely triangular point fragments.

Two other points were found. One is a small flint generalized side-notched (Fig. 91 GGG) specimen from the topsoil, while the other is a Meadowood point of Onondaga chert from Feature 19 (Fig. 91 HHH). The inclusion of the latter point in a Late Woodland pit is considered as an accidental association.

Other Stone Tools

Three classes of stone tools are established, based upon the technique used to modify the raw lithic material into its final form. These classes are: Chipped, Pecked and Ground, and Altered by Usage.

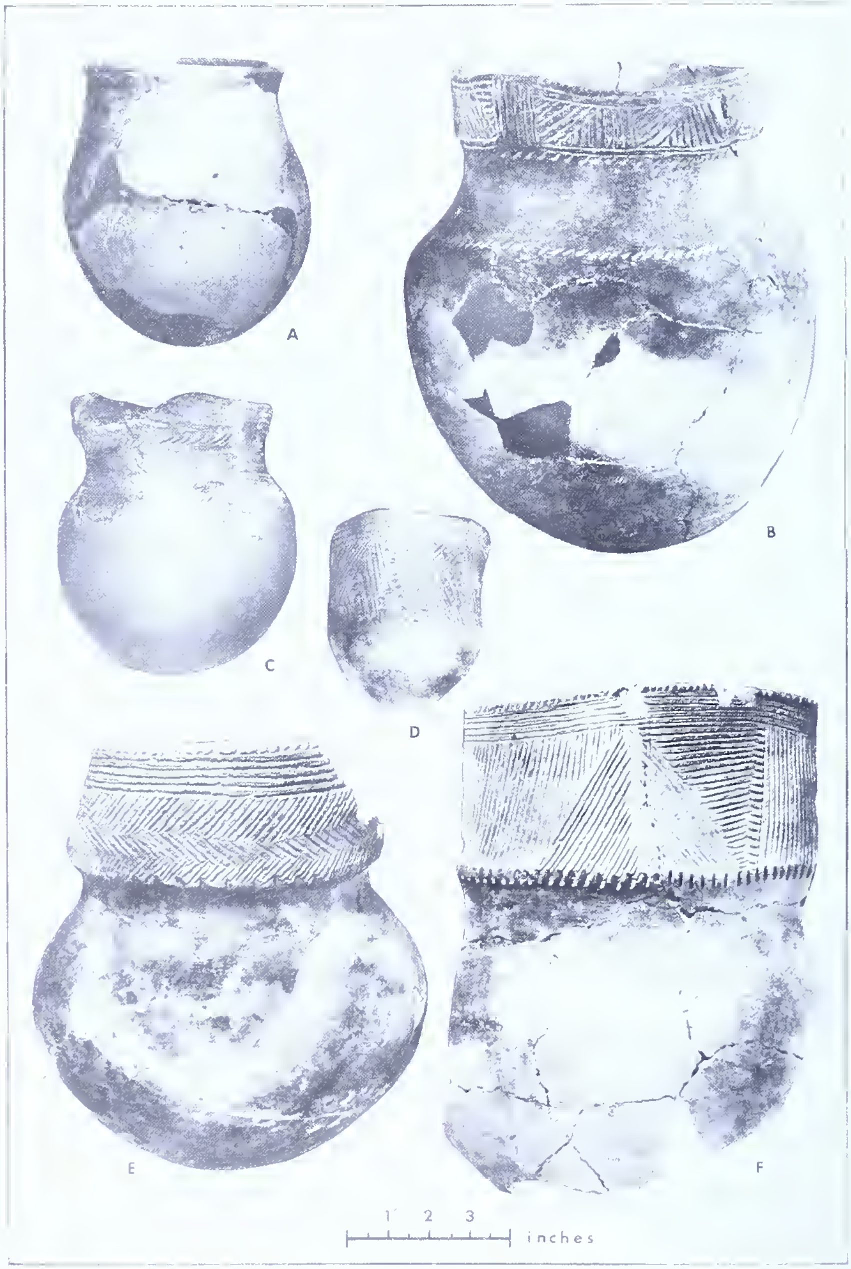


Fig. 74. OWASCO AND TRIBAL SERIES POTTERY from Camp Ministerium, Brodhead, Brodhead-Heller, Kutay, and McCann I sites: A, Late Woodland Plainware, Camp Ministerium, T. P. 4, Feature 1; B, Durfee Underlined, Brodhead, Feature 2; C, Kelso (variant), Brodhead-Heller, Features 1, 3; D, Chance Incised, toy pot, Kutay, Feature 82; E, Abbott Zoned (Kutay variant), Kutay, Feature 3; F, Munsee Incised/Proto-Susquehannock, McCann, Feature 9.

Chipped

Projectile Points	9	
Hoes	5	
Notched Scrapers	3	
Heavy Choppers	12	
Teshoas	10	
Rough Cutting Tools	16	
Netsinkers	7	
Notched Fragments	3	
Saw	1	(Fig. 75 B)
Total or 34.4% of the sample	66	

The heavy choppers are blocky fist-sized pieces, mostly of basalt, though a few are made of sandstone. These have been roughly shaped by percussion. They exhibit more intentional shaping than the teshoas. The latter are merely large spalls with trimmed edges suitable for cutting, scraping, and other purposes. In some instances the teshoa is simply a utilized spall. The rough cutting tools are pieces of stone in a variety of sizes and shapes which seem to have had a brief period of use. They are too diverse and too problematical to merit further description. The saw (Fig. 75 B) is a piece of flat pencil shale 4.7 inches long by 1.72 inches wide with a serrated edge. Trimmed and notched tools resemble both hoes and netsinkers. They are about one-third to one-fourth the size of the hoes, and they appear to have been used as scraping implements. Although their intended purpose is uncertain, the notched fragments do not appear to be broken netsinkers. Other artifacts in this group are obvious types requiring no additional comment.

The chipped category is increased by the inclusion of heavy choppers, teshoas, rough cutting tools, netsinkers, notched stones, and the saw. Actually, these particular items were only slightly altered in order to produce the desired artifact. Projectile points, hoes, and notched implements are tools made by more careful percussion flaking.

Ground and Pecked

Pestles	6
Celts	4
Celts (problematical)	2
Bar Celts	2
Polished Bits	2
Bar-shaped Pieces	6
Shaft Polisher (unfinished)	1
Total or 12.6% of the sample	23

The two polished bits resemble celt bits, but they seem to be scraping tools intentionally made to be hand-held and not hafted. The shaft polisher is unfinished. It is a natural sandstone rock 12 inches long with a long and narrow (8½ inches long by ⅝ inch wide) pecked area across the surface. Deeper pecking and smoothing would have completed the artifact. An identical completed tool assists in the identification of this specimen. This example has been cemented into a retaining wall at Albert Schoonover's home in Bushkill. The remaining items are self-explanatory.

Altered by Usage

Mullers		50	
Plain Mullers	10		
Mullers Used as Hammers or Pounders	10		
Pitted Mullers	5		
Pitted Mullers Used as Hammers or Pounders	25		
Grinding Stones		25	
Used only on 1 Side	9		
Used on 2 Sides	16		
Smooth Pebbles		10	
Shell Openers		4	(Fig. 75 A)
Plane		1	
Hammerstone		1	
Rounded Bit (pebble)		1	
Pitted Stone		1	
Total		93	
or 51.0% of the sample			

Mullers are the most numerous single type of artifact and they are subdivided according to patterns of wear. Half of the series are pitted on one or both sides and show battering along the circumference. Multiple pits occur on about two-thirds of these examples. The smallest group of mullers is pitted and shows no evidence of use as pounding tools. The remaining two groups of mullers are equally divided between plain or simple mullers and those which show traces of wear along the edge and lack of pits. Grinding stones are the nether stones used in conjunction with the mullers. The smooth pebbles are small, ordinary, flat water-worn river stones, and probably were collected items since they are frequently found in refuse pits along with other items of material culture.

Shell openers are a newly recognized artifact (Fig. 75 A). They are unaltered pieces of pencil shale ranging in length from three and one-fourth to five and one-half inches, and they are about three-fourths inch wide. When used frequently, the tip becomes well worn.

Found out of context, it is unlikely that these tools would be recognized for what they are. However, the association of the openers in pits with shell debris leaves little room for doubt that they are implements used for shucking freshwater mollusks.

The plane is a simple heavy stone block with a beveled and worn edge, apparently resulting from being worked in a planing motion. The rounded bit occurs on a smooth, water-worn pebble with one edge worn sharp. The hammerstone is the usual item of this type.

Although most tools were not limited to a single function, the classification of artifacts by usage is more instructive toward revealing

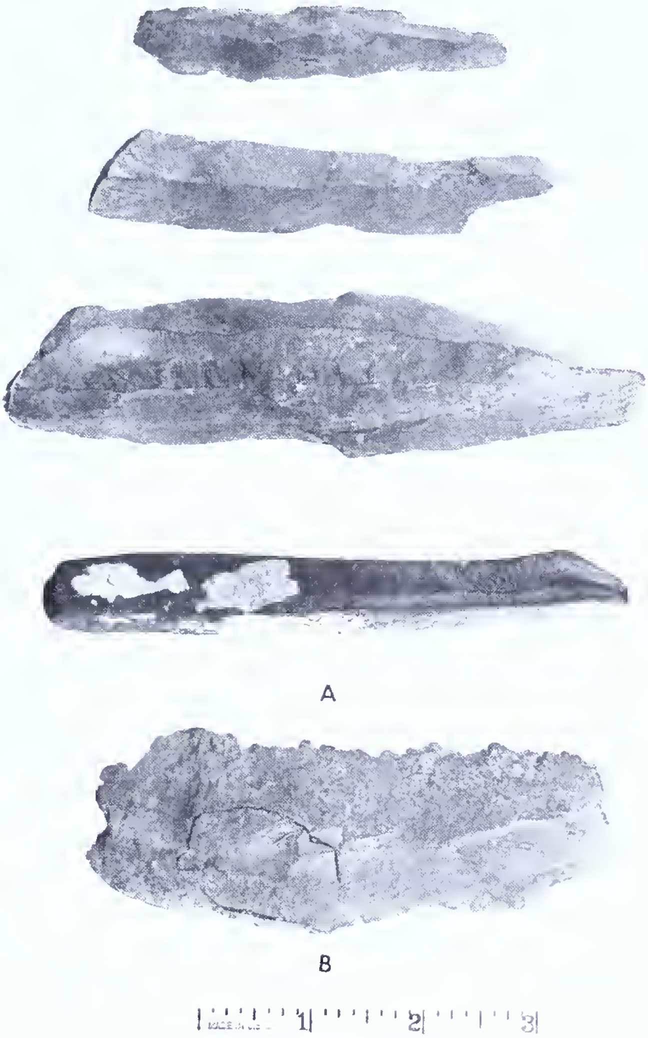


Fig. 75. SHELL OPENERS (A) AND A SAW (B) FROM THE KUTAY SITE: A, shell openers, top to bottom backdirt, Feature 3, Feature 3, Feature 75; B, saw, Feature 45.

the main thrust of the way of life than a classificatory scheme based upon method of manufacture. Attempts at a tight formal classification reflect what the archeologist conceives as the primary purpose of the tool, which is not necessarily the original purpose. For example, projectile points were probably used to kill, pierce, pry, split, cut, etc. Celts, although primarily designed for woodworking, would make acceptable butchering implements for larger game. Most mullers show traces of wear along the circumference and are pitted on the flat surface. They were used to crack nuts and seeds as well as to grind and pulverize a variety of foods including shellfish, and they perhaps served as hammers. Heavy choppers and teshoas must have been used for a number of pulping and cutting chores. The following classification is based upon what is considered to be primary usage.

Hunting and Fishing	8.80%
Projectile Points and Netsinkers (16)	
Agriculture	2.74%
Hoes (5)	
Food Preparation	47.30%
Mullers, Grinding Stones, Pestles, Shell Openers, Pitted Stone (86)	
Wood Working	7.20%
Celts, Bar Celts, Notched Scrapers, Plane, Shaft Polisher (13)	
Hide Working (?)	1.64%
Polished Bits, Rounded Bit (3)	
Pottery Working (?)	5.50%
Smooth Stones (10)	
Stone Working	.53%
Hammerstone (1)	
Multipurpose Cutting and Pulping	24.65%
Heavy Choppers, Teshoas, Bar-shaped Pieces, Rough Cutting, Saw (45)	
Unknown	1.64%
Notched (3)	

Even if this classification lacks a measure of accuracy due to its subjective nature, it is obvious that only two categories, food preparation and multipurpose cutting and pulping, embrace a significant number of tools. Agriculture and the gathering of wild foods must, therefore, occupy the dominant role in the subsistence pattern. Hunting and fishing are of relatively minor importance if the percentage of this type of equipment is reflective of the quantitative importance of these activities. Multipurpose cutting and pulping tools are common enough, but too undiagnostic to indicate whether their significance lies in butchering, pulping wild foods, and wood or hide working.

SHELL REFUSE

Twelve pits contained freshwater mussel shells, all of which were identified as *Elliptio complanatus* Solander (Family Unionidae). An

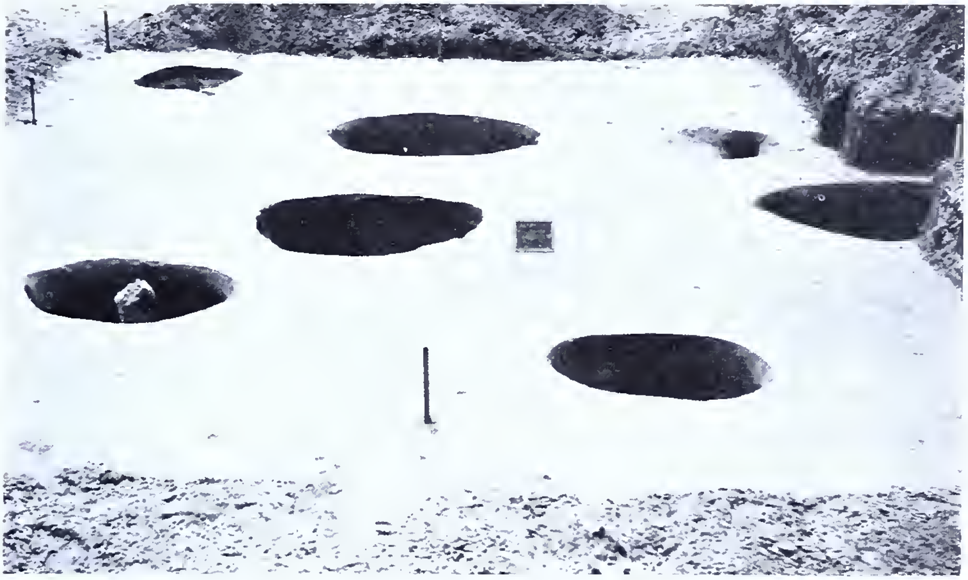


Fig. 76. EXCAVATION SCENE of the large storage and refuse-filled pits at the Kutay site.

analysis of shell by quantity from the midden-filled refuse pits is presented in the following table.

Table 9. Mollusk shell data.

Feature	*Weight* *lb.*	*oz.*	*Quarts*	*Number of Mussels*	*Size range length-inches*	*Mean Size*
3	22	8	17.0	2,088	.6-2.5	1.3
11	1		.7	147	.7-1.4	1.2
13	143	2	111.0	18,549	.9-2.5	1.5
39	4	4	3.0	500	.8-2.1	1.8
51	4	11	3.3	495	.6-2.5	1.6
59	1	12	1.0	170	.7-2.5	1.3
60	95	6	77.0	10,682	.7-2.9	1.8
74	1	12	1.0	161	.8-2.5	1.5
75	31	11	22.0	3,650	.7-2.9	1.5
78	3		2.0	388	.8-2.2	1.4
81	20	2	13.0	1,964	1.2-2.3	1.6
87		8	.2	28	1.0-1.8	1.2
Total	329	12	251.2	38,822		

To secure the data figures for this table, the number of mussel shells in each feature was determined by actual count for the seven features where the quantity of shells was relatively small. The procedure differed for Features 3, 13, 60 (Fig. 77), 75, and 81, which contained larger amounts of shell. In each of these instances the average number of mussels in three one-quart measures was determined. The number of shells was then calculated by measure for each feature.

An attempt was made to relate these figures on the shells to the quantity of meat which they represent. Living freshwater mussels were collected from a bed a few miles down river from the site, near the Walter Wyckoff home below Tocks Island, Shawnee-on-Delaware. These are the same species except that they are three to four times larger than those utilized by the Indians. The living mussels were steamed and the meat removed. The meat was lightly heated and subsequently air-dried in order to eliminate some of the moisture. Shells and meat were counted and weighed. Seventy-four shells weighed seven pounds and eight ounces and these yielded one pound and five ounces of meat. This is a ratio of five pounds of shell to one pound of meat.

This ratio corresponds closely to one established by Carl J. Sindermann, of the United States Fish and Wildlife Service, for *Mytilus edulis,* the common blue mussel of the Atlantic Coast (Salwen Feb. 22, 1968, personal correspondence). An average ratio of shell weight to meat weight for *Mytilus edulis* from Maine, Massachusetts, Rhode Island, Connecticut, and New York is 5.04 wet weight. It appears likely that the 5:1 ratio, or 66 pounds, is at least a good approximation for the amount of molluscan meat represented by the Kutay site shells.

That the *Elliptio complanatus* Solander shells are considerably smaller than modern day examples is not easily explained. Perhaps the smaller mollusks are more tender and the Indians selectively chose this size. Another possibility is that these mollusks were intensively collected, and few specimens reached maturity. Other factors, such as environmental conditions, may have limited growth, but it seems more likely that the human element was the controlling factor.

An immature conch *Busycon canaliculatum* Linne was found in Feature 75. This is a saltwater species whose closest location is the coastal regions of New York and New Jersey. Mature examples were used as stock for shell ornaments, but it is somewhat unusual for a young conch to have been transported from the coast to the Delaware Valley. The presence of this species at the Kutay site suggests coastal trade and/or travel. The occurrence of Milo Corded pottery both at this site and the nearby Faucett site, as well as the presence of Bowman's Brook Stamped and Bowman's Brook Incised pottery and the mackerel shark's tooth at the latter site, is additional evidence for a relationship to the coastal areas of New York and New Jersey.

Animal Remains

Animal remains were scarce, with only pit Features 3 and 13 providing any significant data on the utilization of animals. Feature 3 contained a deer astragalus showing butchering cuts, a calcaneum fragment, two limb bone fragments, all possibly from the same animal, box turtle plastron fragments, and a turkey vertebra. This pit also contained 22 pounds and 8 ounces of mussel shell, a possible Munsee sherd (Fig. 73 F), and the variant of Abbott Zoned (Fig. 74 E). Feature 13 held the greatest quantity of shell (143 pounds and 2 ounces) and of Chance Incised sherds (Fig. 73 C), as well as matching foot elements of a bobcat with butchering cuts on the astragalus. Other animal remains found on the site were a deer phalanx from the topsoil, a woodchuck skull and lower jaw (probably recent) from Feature 14, and small unidentified remains from Feature 45.

Associations

Pits yielding diagnostic pottery, the more significant items of material culture, and shell refuse were recorded on a separate plot plan.

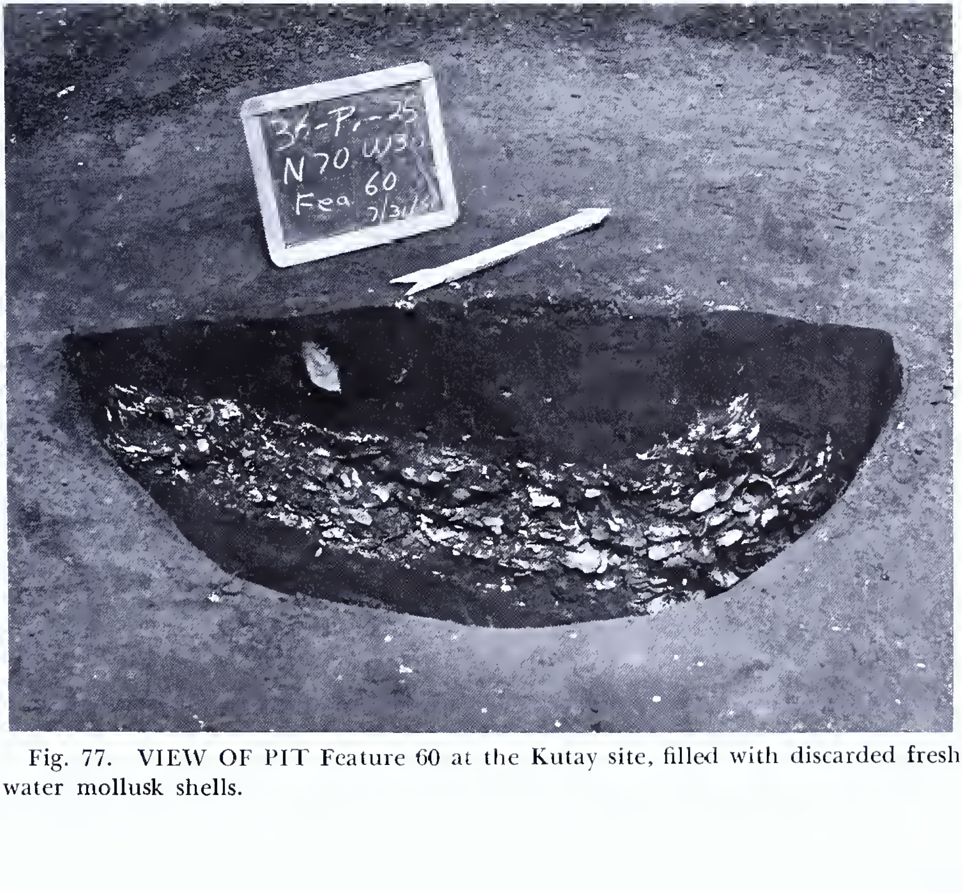


Fig. 77. VIEW OF PIT Feature 60 at the Kutay site, filled with discarded fresh-water mollusk shells.

This was done in order to determine whether there was a consistent pattern or arrangement by horizontal distribution of features and traits If certain clusters of traits were present, it might be possible to interpret them as representing family or clan groups. Possibly separate components might be recognized as occupying the site at various times during the Chance phase. Although there were no obvious associations of this nature, it is possible to make some generalizations.

Of the 72 intentionally prepared pits, only 30 yielded more than a few small body sherds, fragments of worked stone, fire-cracked rock, shell, or other similar non-diagnostic material. Of these 30 reasonably productive pits, two-thirds were large deep pits. Twelve were bell-shaped or undercut, averaging 46 inches in diameter and 33 inches deep, with the largest having a diameter of 60 inches and an identical depth. Nine were deep, basin-shaped pits having an average diameter of 50 inches and an average depth of 33 inches. The remainder were smaller pits: shallow basin-shaped (3), saucer-shaped (1), and small pits or disturbances (5).

Since 16,000 square feet were excavated at the Kutay site, there is the small return of one significant pit per 533 square feet. The data indicate that the pits yielding the greatest quantity of artifacts are the bell-shaped and deep basin-shaped pits. Repeated plowing has sheared off the top portion of the pits, and there is likely distortion in the collections made at any archeological site and where there has been a long period of farming where the topsoil was not screened.

It was hoped that the horizontal distribution might show that the various types of Chance phase pottery tend to group in certain areas. This is not exactly the case. Chance Incised and the unidentified Tribal pottery were evenly scattered throughout the site. Deep basin-shaped Features 50 and 52 held sherds of one Chance Incised vessel, and this type also was found in bell-shaped Feature 13 with Deowongo Incised. Garoga Incised was found singly in deep basin-shaped Feature 16, basin-shaped Feature 15, and Disturbance 35. Garoga Incised was found with Chance Incised in Feature 45 and 46 (deep basin and bell-shaped respectively). This distribution of Garoga Incised formed a rather straight line of features 95 feet long containing Garoga; Garoga and Chance; Garoga and Deowongo; and Garoga and Durfee Underlined.

Feature 3 and Disturbance 26 held fragments of the same Chance Incised vessel.

The occurrence of the several types of diagnostic Chance phase pottery with such non-diagnostic items as mullers, grinding stones, heavy cutting and pulping tools, teshoas, and netsinkers, as well as triangular points under similar repetitious circumstances in the various pits and disturbances indicates that these are valid associations and are a part of the stone tool assemblage of the Chance phase. This is not a remarkable observation, since these artifacts are nearly universal objects of material culture and, consequently, are a part of the assemblage of most archeological complexes in the Tocks Island Reservoir.

The 12 shell refuse pits have an interesting distribution, but one that is without any clearcut significance. All of the five large shell pits, Features 3, 13, 60, 75, and 81 (those containing over 20 pounds of shell midden), were located in the southern half of the site. However, the topsoil-removal operations found additional shell refuse pits north of the excavation plot. Four of the smaller shell pits (59, 74, 78, 87) also occurred in the same area, while only three shell pits (11, 39, 51) were found in the northern half of the site. The distribution of these larger pits shows that the two most distant pits are no more than 80 feet apart, with none more than 40 feet from an arbitrary center point. The large shell pits contained sherds of Chance Incised, Deowongo Incised, Garoga Incised, Durfee Underlined, and the Abbott Zoned-Kutay variant, together with universal and non-diagnostic items. In fact, the large shell midden pits were the most productive features in terms of artifacts.

Features 10, 80, and 84, containing Milo Corded, Kelso Corded, and Bainbridge Linear, respectively, were located in the southern portion of the site. Significantly, each of these three pottery types occurred as the only type in that particular pit. Bell-shaped Feature 10 held, in addition to a single Milo Corded rim sherd, three hoes, two grinding stones, a pestle, a muller, and a plane. The other two pits held no important materials.

INTERPRETATIONS

The major component at the Kutay site is the assemblage representing the Chance phase. In terms of diagnostic traits, this includes the four Chance phase ceramic types: Chance Incised, Deowongo Incised, Durfee Underlined, and Garoga Incised. Deowongo variants, Munsee-like, and the Kutay variant of Abbott Zoned are considered traits of this component, with the first two types forward looking. Kelso Corded and Bainbridge Linear may be minor conservative elements within the Chance phase. These types are often found on sites of the

Chance phase in the Delaware and Hudson valleys. Milo Corded may represent an earlier component, but it may be a trade sherd.

A Meadowood point and a small side-notched point are the only other items diagnostic enough to be considered traits of another component.

A less likely interpretation is that each of the major Chance pottery types is a separate component. Chance phase pottery is a continuum with increasing elaboration of a basic motif. Often very minor differences distinguish one type from another, and it seems reasonable to conclude that these are variations within a single component. The hypothesis that each type is a component fails to consider that human beings made pottery and that potters are bound to experiment and embellish, even though cultural conformity is a powerful factor in a primitive community.

A seemingly persuasive argument against the multicomponent view is the fact that only Features 46 and 47 intersect, although several others are very close together. This readily suggests that most of the pits were dug over a relatively short period of time. If the area had been abandoned and the pits allowed to fill naturally, then it is likely that later groups of Indians would have dug into the earlier pits on several occasions. In other words, if this were a multicomponent site, there ought to be more than one instance where one pit has intruded into another. There is no evidence for the pits being disturbed by human activities. Furthermore, it appears that when new pits were prepared, the exact locations of the existing pits were known and their integrity was intentionally preserved.

The true purpose of the pits cannot be verified, but presumably a majority were originally prepared for storage purposes. Probably the deep basin and bell-shaped pits were bark- or grass-lined storage receptacles. They would hold and preserve dried foods for future use as well as offer a measure of protection from foraging herbivores. It seems safe to assume that the Indian had a relatively indifferent attitude toward sanitation and that, therefore, the use of the pits for disposal of refuse is secondary, or even fortuitous. As certain pits came into disuse and were abandoned as storage pits, they gradually filled by natural slumpage and weathering. This would occur if the sites were unoccupied. If the pit itself merely came into disuse, it may have been filled with household sweepings and litter to form an even floor.

A charcoal sample submitted to the Yale University Radiocarbon

Laboratory provides a date of A.D. 1400 ± 80 years (Y-2338) for the contents of the bell-shaped refuse Pit 75. This feature contained the remains of two vessels of the Deowongo Incised type (Fig. 73 G, H), one Garoga Incised vessel, and one Durfee Underlined vessel together with a flint triangular point, a pestle, six mullers, two grinding stones, a netsinker, and a shell opener. This date for the Chance phase compares favorably with the date for the Getman site of eastern New York, which is A.D. 1398 ± 150 years (Ritchie 1965a: xviii). The Getman site is a Chance phase site enclosing four to six longhouses within an oval, double-walled stockade. Topographically, the two sites are similarly situated on flat, poorly defended ground.

In comparison with Chance phase sites of the Mohawk Valley of eastern New York, the Kutay site offers both similarities and contrasts. Most of those sites are on low ground or low-lying knolls and ridges which are not easily defended. Burials are rare. None of the sites is large or particularly rich in material culture. Freshwater mollusks are present at two sites and apparently in some quantity at the Kingston site (Ritchie 1952). The above factors are similar to conditions at the Kutay site.

There are also contrasts between the two areas, and these are sharpest in the type of features encountered. Most Kutay site data come from pits, particularly large storage pits. The latter are not as common in the Mohawk Valley sites. Hearths and middens are absent at the Kutay site but present at Chance phase sites in the Mohawk Valley. Only the Getman site yields significant data on settlement patterns, while there is the probability of a longhouse at the Deowongo Island site.

The chronological position of the Kutay site is established by the radiocarbon date of A.D. 1400 ± 80 years. On the basis of the frequency of pottery types it is clear that no one type was strongly preferred. The site would appear to fall between the Chance and Getman sites, providing cultural succession in the Mohawk Valley and the Upper Delaware Valley are synchronic.

Because there was no large amount of accumulated midden refuse other than shell (which could have been collected and eaten over a relatively short period), the Kutay site probably was occupied for a relatively brief time. In view of the small amount of midden remains, the high percentage of stone tools associated with women's work (farming, collecting, and the preparation of foods) in contrast with a low percentage of projectile points and the supportive evidence for a single component site, it is tempting to speculate that the site was occupied for a period as brief as a single growing season. The hypothesis follows.

The main thrust of the economy is directed toward a corn, bean, and squash agriculture. Diet is supplemented by collecting wild seeds, nuts, and freshwater mollusks. Other riverine food resources were utilized. Hunting is relatively unimportant, although small game and birds were caught in traps, snares, and deadfalls. The house type is unknown but longhouses are known elsewhere for the Chance phase. To speculate further, women, children, and older men unable to hunt moved into the area in the spring to plant crops and take advantage of the shad run. Permanent houses were not constructed, although clusters of four storage-pit arrangements can be perceived. While the able-bodied male population was intermittently away on hunting expeditions, crops were tended and gathered, foods were dried, and prepared for future use. Warfare was not a factor. The population of the settlement might increase with the return of the hunting parties in the fall during the harvesting, processing, and storing of food for winter use.

Brodhead Site

36-Pi-30

INTRODUCTION

THE BRODHEAD site is situated on the lowest terrace of the flood plain about one mile north of Bushkill, Pennsylvania. It can be located at 41 degrees, 06 minutes, and 13 seconds north latitude and 74 degrees, 59 minutes, and 20 seconds west longitude. A narrow dirt lane divides the site and provides access to several river-front houses (Fig. 78). The lane once served to connect Route 209 to the landing where the now defunct Rosenkrans' Ferry operated between Pennsylvania and New Jersey.

The site is no longer farmed and at the time of the archeological investigations, the fields supported a cover of weeds and rye grass. One hundred and twenty-five man-days were spent excavating the site from June 10 to July 14, 1965. Two plots were excavated for a total of 4,050 square feet. One excavation took place in the field north of the lane, while the other was in the south field. The property is presently owned by the Commonwealth of Pennsylvania and is under the jurisdiction of the Department of Forests and Waters.

FEATURES (FIGS. 79, 80)

Eighteen pits were located and cleared, and they conform to the following configurations: basin (6), shallow cone (3), cone (2), deep basin (2), and saucer (2). Profile drawings were not made for three pits. Two pits contained shell refuse, one pit was bark-lined, and two were sterile.

Six rock-filled hearths, and three somewhat dubious ones, were encountered. These were oval to circular in outline and ranged from about 14 inches to 36 inches in diameter. For the most part the hearths were devoid of diagnostic artifacts, but they are believed to be characteristic of the Owasco and Tribal components.

There were 62 postmolds but no discernible house pattern was present. In the south excavation there is a fairly straight line of postmolds about 50 feet in length, and in the vicinity of Pit 27 there is an arc with a diameter of about eight feet. Neither of these possible patterns is sufficiently complete to represent a house plan.

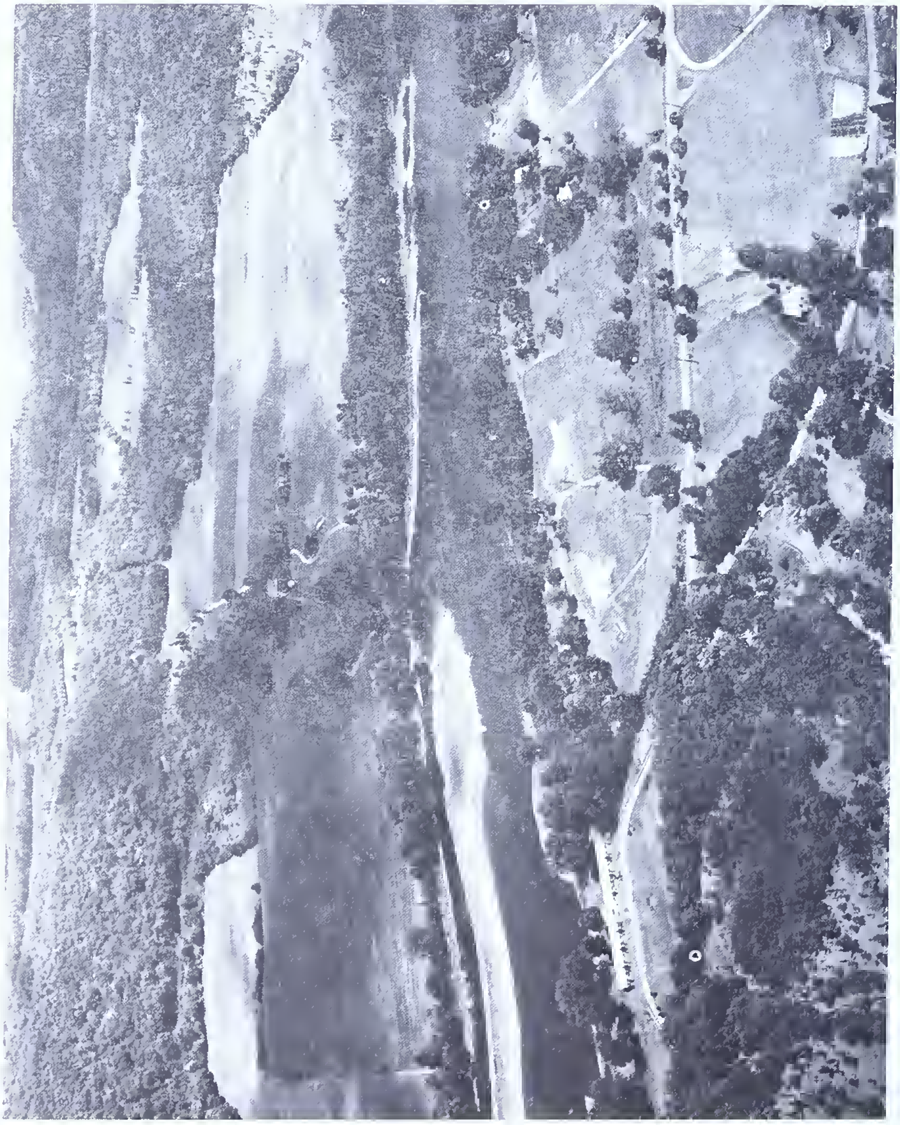


Fig. 78. AERIAL VIEW OF THE BRODHEAD SITE.

Several concentrations or habitation areas show in the subsoil as slight disturbances with patches of fire-reddened soil. Although there were flecks of charcoal scattered throughout these disturbances, no charcoal samples were deemed suitable for radiocarbon analysis.

Cultural Materials

Pottery

Based on analysis of a total sample of 522 rim and body sherds, the following pottery types are recognized:

Early Series	
Brodhead Net-Marked	1 partly reconstructed vessel (Figs. 81, 82) 5 rim sherds 98 body sherds
Exterior Corded/Interior Smoothed	1 rim sherd 19 body sherds
Vinette 1	1 rim sherd 17 body sherds
Wiped	16 body sherds
Scraped	3 body sherds
Fabric-Impressed	2 body sherds

	Estimated Number of Whole Vessels Based Upon Rim Sherds		
Owasco			
Sackett Corded	2	15.4%	
Castle Creek	1	7.7%	
Tribal			
Garoga Incised	3	23.1%	
Durfee Underlined	1	7.7%	(Fig. 74 B)
Munsee-like	1	7.7%	
Chance Incised	1	7.7%	
Unknown Tribal	1	7.7%	
Unidentified Tribal	1		
Other			
Corded Punctate	1	7.7%	
Late Woodland Plain	2	15.3%	

Brodhead Net-Marked pottery (Figs. 81, 82) was found and recognized as a result of testing at the Brodhead site during the site survey in 1965 (Kinsey and Kent 1965: 126, Fig. 3). The pottery type has been defined and named after subsequent fieldwork at the Faucett site yielded a larger collection and after the occurrence of the type was observed for other sites in the Upper Delaware Valley (refer to pages 455-6 in the Appendix for a description of the type and to Fig. 48 A for an illustration of similar pottery from the Faucett site).

Three small sherds of the Early Series have a tooled or scraped

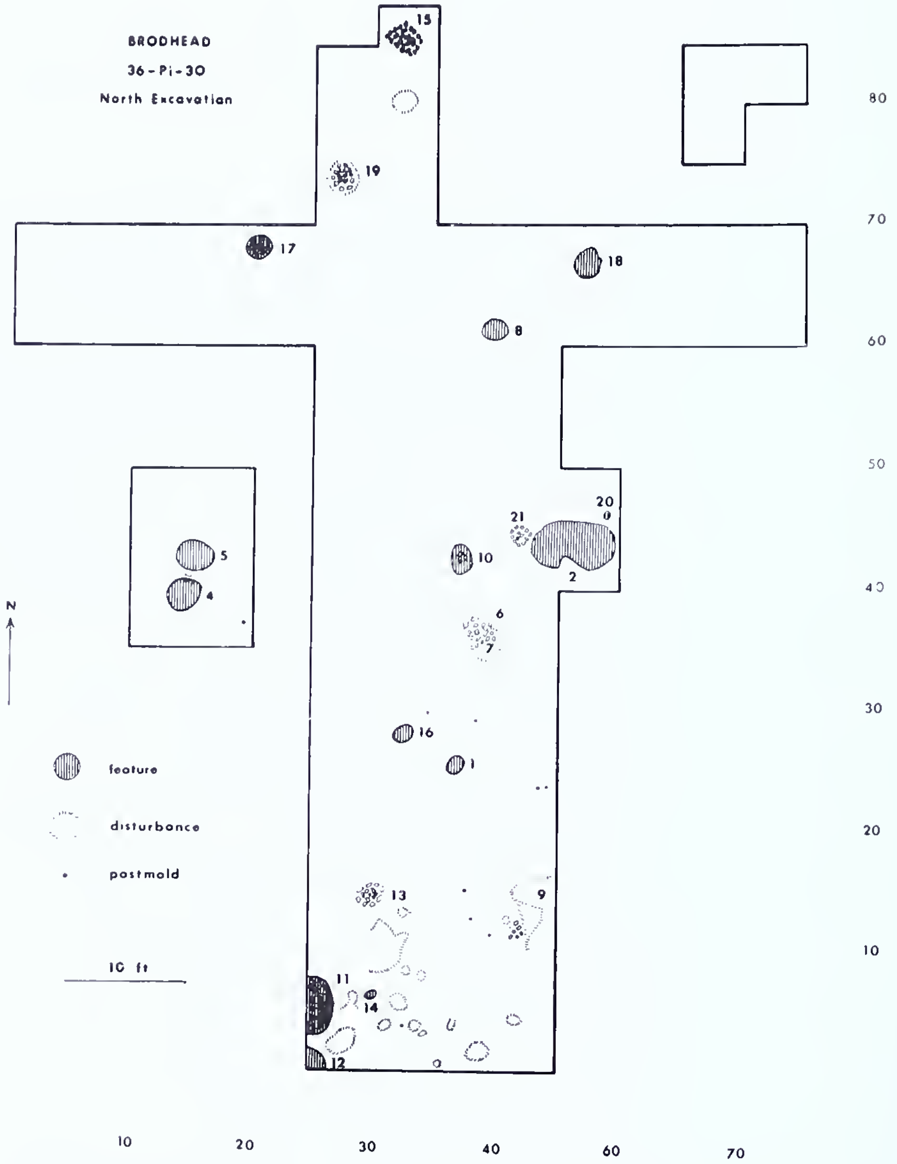


Fig. 79. NORTH EXCAVATED AREA OF THE BRODHEAD SITE.

exterior surface. This surface treatment is probably a minor variation within the series of generally thick-walled and coarse grit-tempered pottery.

The Tribal rim sherd of unknown type has a low collar with a single band of diagonally incised lines, and the lower collar edge is notched. Horizontal and diagonally incised lines are on the neck. The sherd is heavily tempered with mica.

Projectile Points—21	
Late Woodland	
Madison—2 (Fig. 91 PP)	
Lithic preference	
Flint	2
Generalized Triangular—2	
Lithic preference	
Flint	2
Middle Woodland	
Rossville—1	
Lithic preference	
Flint	1
Lagoon—1	
Lithic preference	
Argillite	1
Side-Notched—1	
Lithic preference	
Chert	1
Jack's Reef Corner-Notched—2 (Fig. 91 QQ, SS)	
Lithic preference	
Flint	1
Chert	1
Jack's Reef Pentagonal—1	
Lithic preference	
Chert	1
Early Woodland	
Meadowood—3 (Fig. 91 TT, RR)	
Lithic preference	
Onondaga chert	2
Flint	1
Early Woodland—Fishtail Tradition	
Orient—5 (Fig. 91 VV, WW)	
Lithic preference	
Jasper	2
Chert	2
Flint	1
Late Archaic—Broadspear Tradition	
Perkiomen—1 (Fig. 91 XX)	
Lithic preference	
Jasper	1
Lehigh—1 (Fig. 91 ZZ)	
Lithic preference	
Jasper	1
Late Archaic	
Lamoka-like—1	
Lithic preference	
Chert	1

The identification of one specimen as Rossville is not a certainty because it has been damaged through use as a knife and/or reamer.

Also, the identification of one specimen as Lamoka-like is somewhat tenuous.

Other Stone Tools

Chipped

Projectile Points (including 9 tips and fragments)	30	
Blank	1	
Drill	1	(Fig. 91 YY)
Bifaces	2	
Netsinkers	8	
Teshoa	1	
Hoe	1	
Possible Hoe	1	
9 Cores and blocks of raw material; Spalls: Jasper 421, Chalcedony 192, Flint 114, Argillite 64, Chert 53, Shale 8, Other 2		
Total or 80.4% of the sample	45	

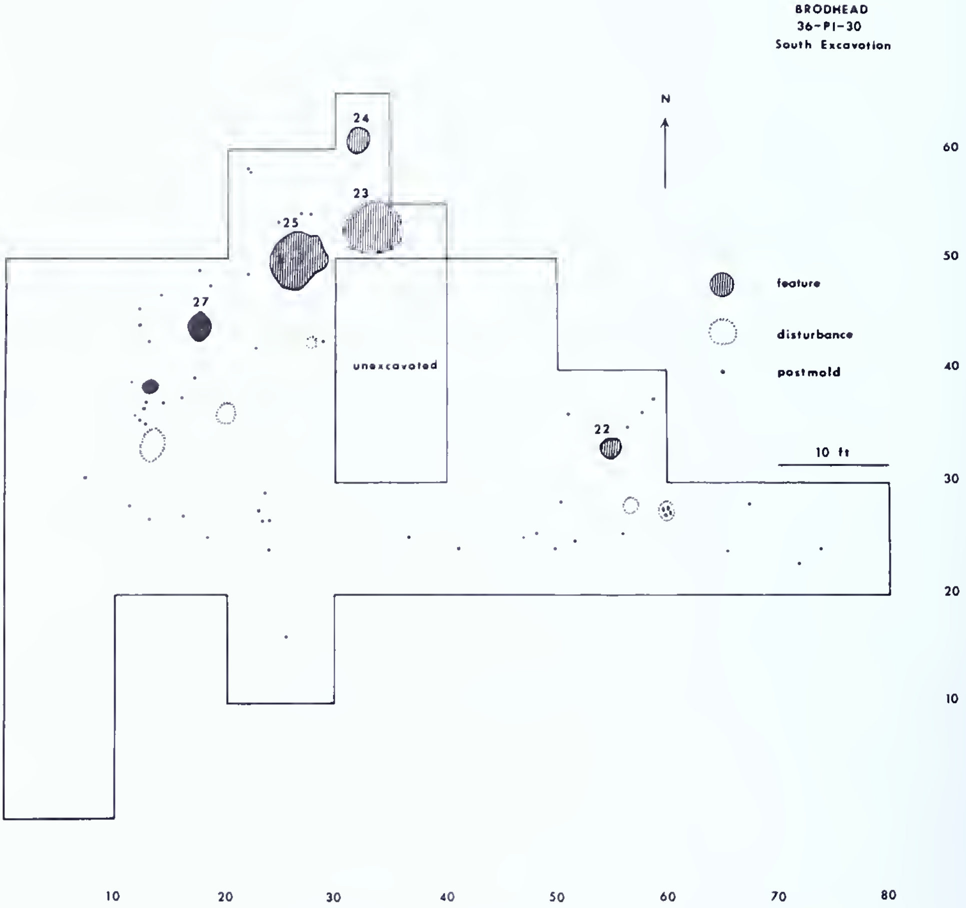


Fig. 80. SOUTH EXCAVATED AREA OF THE BRODHEAD SITE.

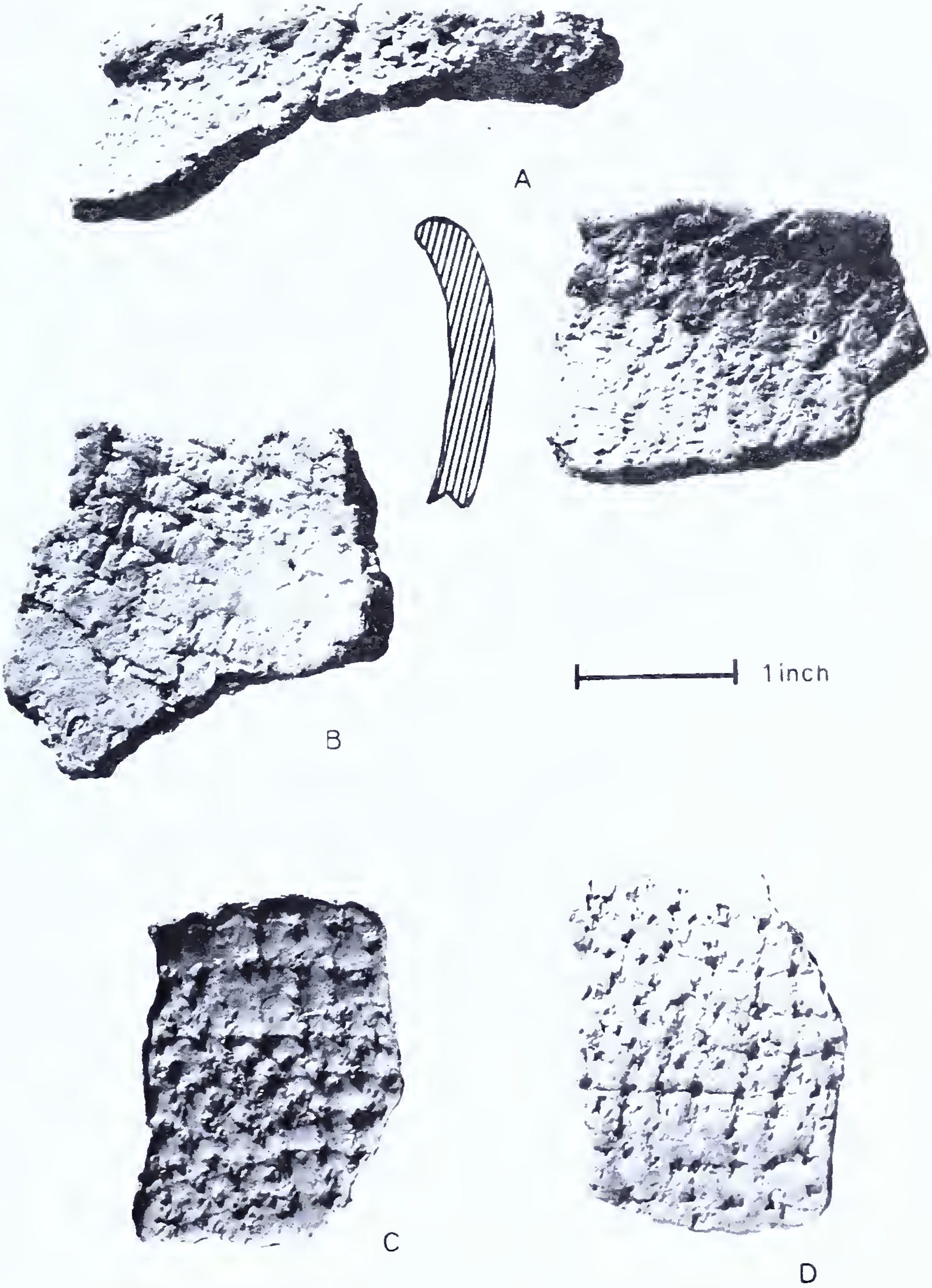


Fig. 81. BRODHEAD NET-MARKED POTTERY FROM THE BRODHEAD SITE: A, exterior rim sherds; B, interior body sherd; C, latex cast of net-markings on D; D, exterior body sherd.

Ground and Pecked	
Celt	1
Total	1
or 1.8% of the sample	
Altered by Usage	
Mullers	5
Pitted Stones	2
Natural Cobbles (use problematical)	2
Pencil Shale (use problematical)	1
Total	10
or 17.8% of the sample	
Other	
Hematite	1
Steatite Bowl Fragment	1

The lump of hematite contains inclusions of quartz and clay. It probably has been heated, but it is not known if this alteration was intentional or accidental.

ASSOCIATIONS

There are relatively few instances at the Brodhead site where diagnostic artifacts are found associated with other significant materials in the context of an undisturbed feature. The culture-bearing stratum is very shallow, and most of the components are both horizontally and vertically mixed. A number of the diagnostic point types are from the topsoil, while such typically Early and Middle Woodland types as Orient, Meadowood, Jack's Reef, Rossville, and Lagoon are found in the first level of the subsoil.

A single Perkiomen point is from the second level and is associated with a number of jasper spalls. Possibly the steatite bowl fragment, which is from a locus 10 feet distant, belongs to the same component. The base of an Orient point, a workshop area of jasper and chert spalls, and a few Vinette 1 and Fabric-Impressed sherds were found in the superior level of the same square as the Perkiomen point.

There are five workshop and/or living areas where a quantity of jasper, flint, chert, and chalcedony spalls are associated with Early Series pottery. Four of the areas are about 10 feet in diameter, while the largest measures nearly 30 feet across. This material was found in the first level of the subsoil immediately below the plow zone. Unfortunately, no other diagnostic material is found in these areas. It is curious that chalcedony is second in popularity to jasper, yet there is no finished artifact made from this material. Chalcedony occurs at the Brodhead site with a greater frequency percentage than at any other site in the reservoir.

A rim sherd of Owasco Corded Oblique is associated with a hoe, a trimmed and notched implement, a lump of hematite, and shell debris. Pit 2, a large (84 inches in diameter), deep, basin-shaped feature, apparently was used for cooking and for other food preparation activities. This pit contained the restored vessel of the Durfee Underlined type executed in an interrupted technique (Fig. 74 B). The crushed vessel was found below and surrounded by a quantity of fire-cracked rock. Pit 2 also held four pitted mullers, a netsinker, and a concentration of charcoal. Rim sherds of two Garoga Incised vessels and an unidentified Tribal sherd were found in basin-shaped Pit 4 with four netsinkers, a celt fragment, pencil shale, a teshoa, freshwater mollusk shell, and deer, elk, and shad remains, as well as a fragment of a human femur.

Other wild animal remains from the Brodhead site are squirrel and raccoon, while pig and sheep bones represent modern domesticated animals. There are apparently no other significant associations for the Brodhead site.

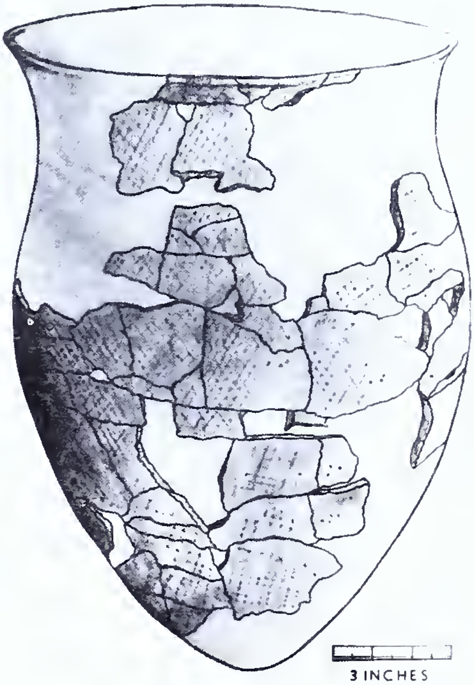


Fig. 82. RECONSTRUCTION OF VESSEL of the Brodhead Net-marked type from the Brodhead site.

INTERPRETATIONS

No diagnostic materials represent the Delaware Valley Archaic complex, and a single Lamoka-like point may be the only Late Archaic type except for one Lehigh and one Perkiomen broadspear. The former is a surface find, while the Perkiomen point may be associated with a steatite bowl fragment and a jasper drill (Fig. 91 YY). Although the drill is a surface find it may be a Perkiomen trait. A drill with a somewhat similar mushroom-shaped base was found in the Perkiomen component at Brodhead-Heller (Fig. 63 II), while another drill of this type was located at the Camp Ministerium site (Fig. 96 M). It was noted that certain drills were pressure flaked along the basal edge so that the tool might have served as a scraper or light planing tool as well as a drill. This appears to be a trait of broadspear and fishtail traditions.

Early Woodland is represented by several Orient and Meadowood traits. Five points are of the former type and three are the latter type. On the basis of information retrieved from the Faucett and other sites in the Upper Delaware Valley, the Early Series pottery complex is thought to endure for a span of time extending from Early to Middle Woodland. It is believed that this pottery complex has an internal chronology, but at present the details are not resolved. For the Brodhead site it can be suggested that Vinette 1 may be associated with the Orient and/or the Meadowood components. The Exterior Corded/Interior Smoothed pottery might also be a trait of these components.

The Bushkill complex as defined on pages 364-9 includes as diagnostic traits Rossville, Lagoon, and side-notched point types, Brodhead Net-Marked as the majority pottery type together with other types of the Early Series, subrectangular gorgets, bola stones, and a variety of less diagnostic implements. Later traits are represented by Jack's Reef Corner-Notched and Pentagonal points, and it is likely that this component would share with the Bushkill complex some of the same characteristic pottery types.

If it were not for the mixed associations, it might be possible to define more sharply the content of these various cultural manifestations. There is no suggestion of long-term occupancy of the site by any of them.

Owasco and Tribal are two small Late Woodland components. The former is recognized by three pottery types (including corded punctate), a hoe, and a trimmed and notched implement. Farming, hunting, and fishing are implied economic activities as is the utilization of freshwater mollusks. The Tribal component is represented by Garoga Incised, Durfee Underlined, Chance Incised, and Munsee-like types. Artifact traits include netsinkers, teshoas, and celts. Triangular points and netsinkers are undoubtedly shared traits. Other shared traits are identical food production and collecting activities as well as similar types of storage and food preparation pits and rock-lined hearths.

The Tribal component probably occupied the site between A.D. 1450 and A.D. 1500, while the Owasco component was possibly 100 to 150 years earlier. There are no definite house patterns, and no extended occupancy is indicated for either of these Late Woodland components, although the intensity and duration of the later occupation is believed to be greater than those of the preceding component.

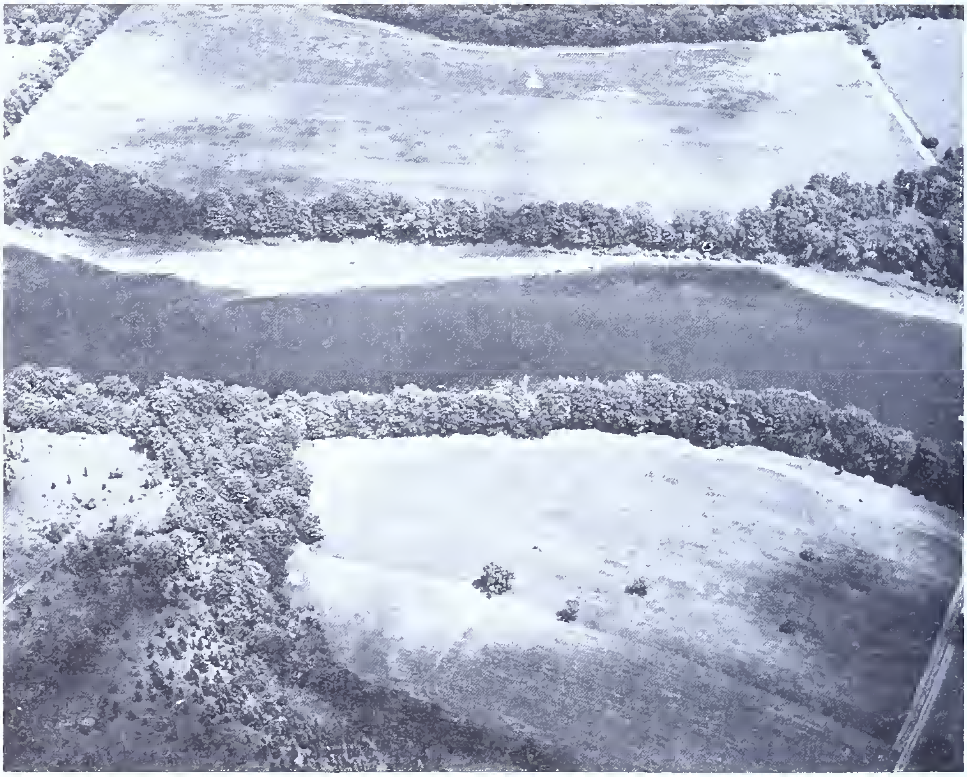


Fig 83. AERIAL VIEW OF THE CAMP MINISTERIUM SITE.

Camp Ministerium Site

36-Mr-8

INTRODUCTION

THE Camp Ministerium site is the property of the Eastern Pennsylvania Synod, Lutheran Church in America, and is operated as a summer co-educational church camp. It can be located at 41 degrees, 03 minutes, and 28 seconds north latitude and 75 degrees, 01 minute, and 06 seconds west longitude. The site is on the lowest terrace, about 25 feet above normal water level (Fig. 83). Prior to the establishment of the present camp the area was farmed, and plow scars in the sub-soil and the decayed remains of a fence post attest to these activities. At the time of the excavations the site was covered by coarse grass and weeds. The excavation comprised 27 adjacent 10-foot squares with minor extensions, 280 lineal feet of test trenching, and 175 square feet of test squares, for a total excavation of 3,600 square feet.

A large exploratory test trench, equal in area to a rectangle 50 by 10 feet, was dug to a depth of 78 inches. Part of the trench was dug by hand in six-inch levels, while another section was dug by mechanical means. The soil profile is typical of the flood plain profiles found in the Upper Delaware Valley. A topsoil of 12 to 18 inches in thickness is underlain by reddish tan-colored alluvium which becomes more compact and more clayey and grayish as the depth increases. Reddish iron oxide bands are interspersed throughout the alluvium, and at one point there is a narrow lens of gravel. A thin continuous lens of charcoal over 40 feet long was encountered at 72 inches below the surface. No cultural materials were located at this deep level, nor was there any positive indication of human activities. It is believed that the charcoal was caused by a natural fire and that overbank flooding may have contributed to the even distribution of the lens. Two smaller, 5- by 5-foot test squares, dug to depths of 36 and 60 inches, yielded no evidence of human occupation. The Camp Ministerium site was excavated for 140 man-days from June 21 to July 28, 1965.

FEATURES (FIGS. 84, 86)

A total of 35 features was located in the main excavation plot and in the test trenches. Twenty-nine features contained artifacts, while

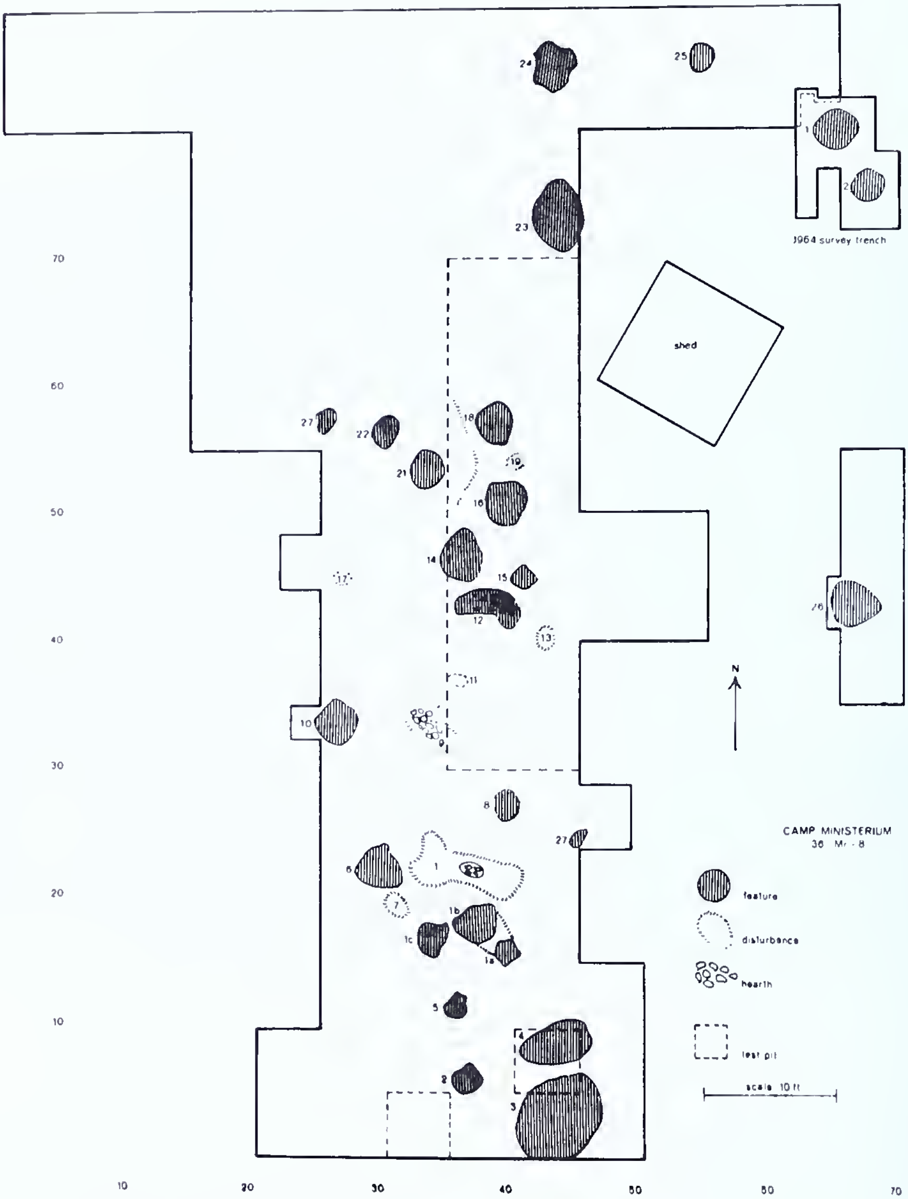


Fig. 84. EXCAVATED AREA OF THE CAMP MINISTERIUM SITE.

six were sterile. There were 27 distinctive pits with the following types present: saucer (9), shallow cone (4), basin (2), and cone (1). Profile drawings were not made for 11 pits. There were three rock-lined hearth features. Postmolds were difficult to identify and there appeared to be only one positive postmold along with 69 dubious ones. Postmolds are not shown on the site plot.

CULTURAL MATERIALS

POTTERY

One thousand and thirty-three sherds comprise the ceramic collection from the site. The following types are represented:

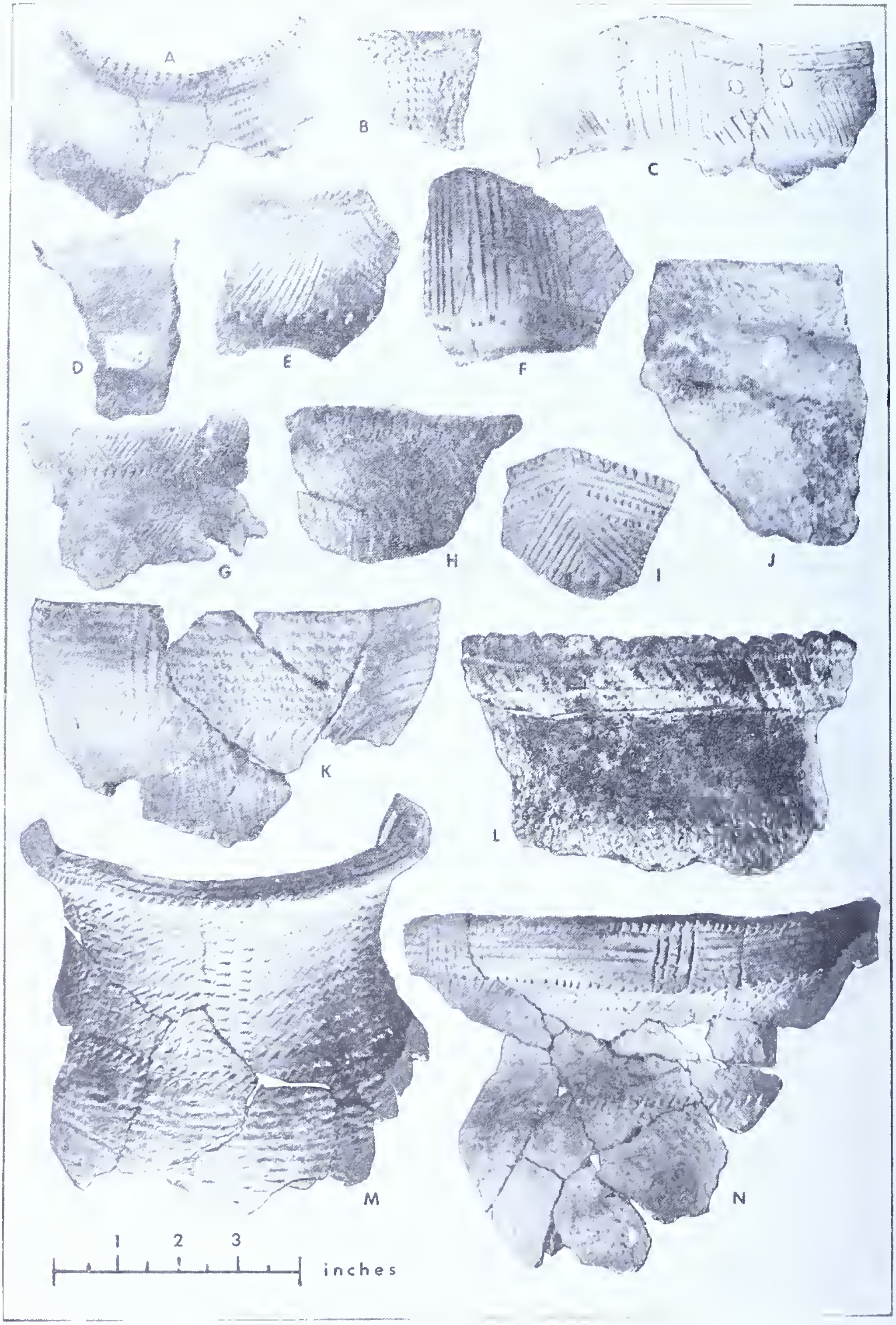
Early Series	
Vinette 1	2 body sherds
Unidentified	4 body sherds

	Estimated Number of Whole Vessels Based Upon Rim Sherds		
Owasco			
Owasco Corded Punctate	4	14.3%	
Carpenter Brook	2	7.1%	(Fig. 85 B)
Owasco Punctate	1	3.6%	(Fig. 85 J)
Kelso Corded	1	3.6%	(Fig. 85 K)
Unidentified Owasco	3		
Other			
Late Woodland Plainware-Ministerium Variant	2	7.1%	(Fig. 74 A)
Intermediate			
Bainbridge Linear	4	14.3%	
Tribal			
Chance Incised	7	25.0%	
Otstungo Notched	3	10.7%	
Deowongo Incised	2	7.1%	(Fig. 85 G)
Durfee Underlined	1	3.6%	
Garoga Incised	1	3.6%	
Unidentified Tribal	11		
Total	42		

There are also fragments of two toy pots and a possible Owasco pipe stem.

PROJECTILE POINTS—26

Late Woodland	
Madison—8 (Fig. 96 C, D)	
Lithic preference	
Flint	6
Chert	1
Jasper	1
Levanna—5	
Lithic preference	
Flint	2
Chert	2
Jasper	1
Middle Woodland	
Rossville—1 (Fig. 96 G)	
Lithic preference	
Argillaceous shale	1


A
B
C
D
E
F
G
H
I
J
K
L
M
N
1
2
3
inches

Late Archaic—Broadspear Tradition	
Perkiomen—2 (Fig. 96 J, K)	
Lithic preference	
Flint	1
Argillaceous shale	1
Broadspear Blank—1 (Fig. 96 L)	
Lithic preference	
Andesite	1
Late Archaic—Delaware Valley Archaic Complex	
Lackawaxen Straight Stem Subtype—2 (Fig. 96 T, U)	
Lithic preference	
Shale	1
Argillite	1
Macpherson—1 (Fig. 96 S)	
Lithic preference	
Shale	1
Laurentian	
Brewerton-like—2 (Fig. 96 Q)	
Lithic preference	
Flint	2
Other	
Generalized Side-Notched—3 (Fig. 96 P, R)	
Lithic preference	
Flint	2
Chert	1
Straight Stem—1	
Lithic preference	
Flint	1

There are also five triangular blanks.

Other Stone Tools

Chipped		
Projectile Points (including 13 tips and fragments)	39	
Broadspear Blank	1	(Fig. 96 L)
Triangular Blanks	5	(Fig. 96 A, B)
Drills	3	(Fig. 96 E, F, M)

←

Fig. 85. OWASCO AND TRIBAL SERIES POTTERY from the Brodhead-Heller, Camp Ministerium, McCann, Peters-Albrecht (21 and 22), and Lee's Terrace sites, and the Macpherson collection: A, Owasco Platted, Brodhead-Heller, Feature 1; B, Carpenter Brook, Camp Ministerium, Feature 2; C, Deowongo Incised, McCann, Feature 20; D, Wiped (interior) McCann, Feature 16; E, Deowongo Incised, Peters-Albrecht (22), Feature 7; F, Munsee Incised, Peters-Albrecht (22), Feature 5; G, Deowongo Incised, Camp Ministerium, Feature 16; H, Point Peninsula Rocker-Stamped, Peters-Albrecht (21), Feature 20; I, Munsee Incised, McCann; J, Owasco Punctate, Camp Ministerium, Feature 1; K, Kelso Corded, Camp Ministerium, Feature 8; L, Owasco (variant), Macpherson Collection; M, Owasco Corded Punctate, Brodhead-Heller, Feature 1; N, Bainbridge Linear, Lee's Terrace, Feature 3.

Bifaces	2	
Scrapers	4	(Fig. 96 V)
Teshoas	2	
Chopper	1	
Netsinkers	16	
23 Cores and blocks of raw material; Spalls: Flint 458, Jasper 173, Chert 89, Argillite 74, Other 4		
Total	73	
or 82.0% of the sample		

Ground and Pecked

Gorget	1	(Fig. 97 A)
Celts	2	(Fig. 97 B, C)
Notched Ornament	1	(Fig. 97 F)
Total	4	
or 4.5% of the sample		

A second gorget was found along the river bank while surface hunting.

Altered by Usage

Mullers	3
Natural Cobbles (use problematical)	5
Total	8
or 9.0% of the sample	

Worked Bone

Deer Cannon Bone Awl	1	(Fig. 97 D)
Deer Phalanx, Cup and Pin Game	1	
Bird Bone, Bead Stock	1	
Deer Antler, Grooved and Snapped	1	
Total	4	
or 4.5% of the sample		

Other

Fossils	2
Fossil Corals	2
Quartz Crystals	2
Volcanic Tuff	1
Total	7

One fossil is a steinkern which is a mud replacement of the interior of a marine gastropod. Steinkerns are common among marine sedimentary rocks all over the world in rocks of all ages. It would be difficult, if not impossible, to identify the source of this steinkern. The other fossil is a piece of fossiliferous limestone, probably Devonian, and occurs locally. A Devonian reef located three miles northwest of East Stroudsburg along the present Pennsylvania Route 90 is the likely source of the two fossil corals. The volcanic tuff is pitted, cut, and scored and is an unexpected find. The original source of this material is unknown. Two quartz crystals were also unearthed.

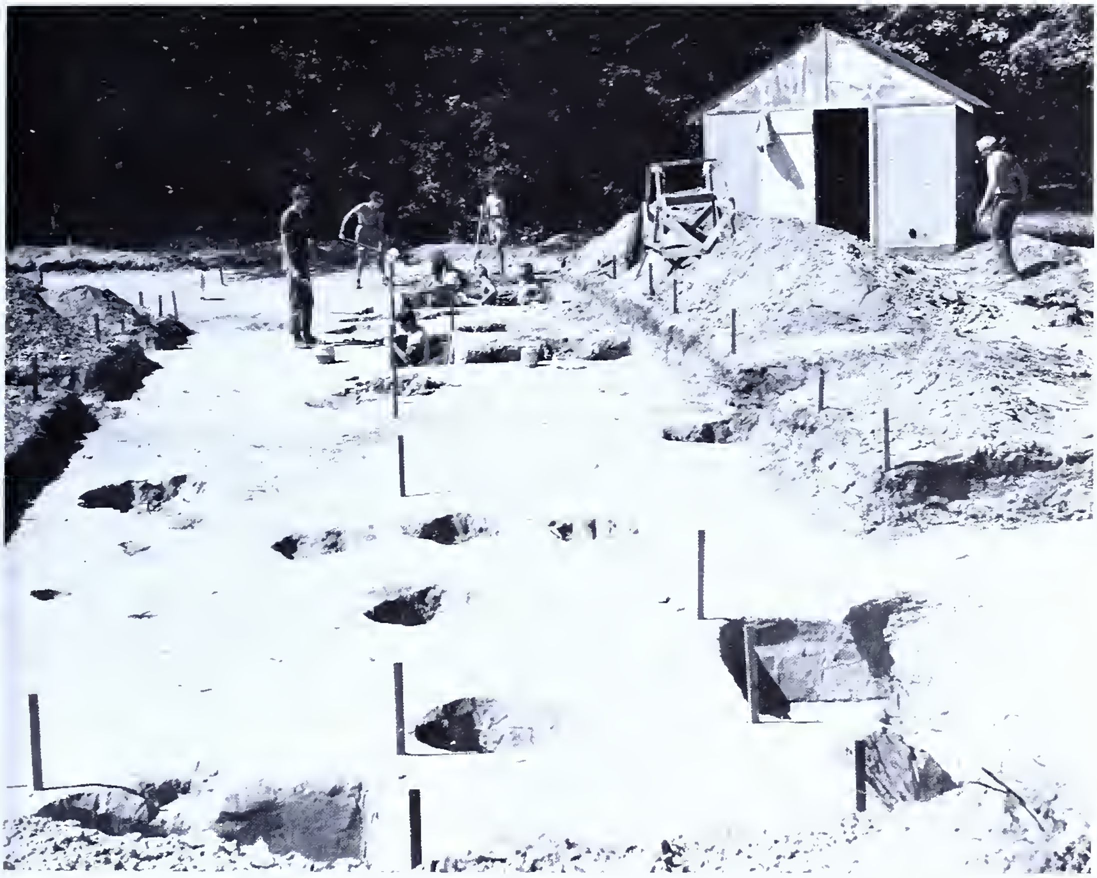


Fig. 86. GENERAL VIEW OF THE EXCAVATIONS at the Camp Ministerium site.

ASSOCIATIONS

Nearly all the contents of the midden-filled pits pertain to a Late Woodland occupation. Consequently, ceramics are the most diagnostic material for determining artifact associations and traits for the several components. However, the contents of a pit or feature are not necessarily the product of a single component, for there are often misleading accidental mixtures. The following associations of pottery occur in the pits and features:

Early Series

Vinette 1
Unidentified

Owasco

Carpenter Brook
Kelso Corded
Owasco Corded Punctate

Owasco Corded Punctate and Bainbridge Linear
Owasco Punctate, Bainbridge Linear, and Late Woodland Plainware

Tribal

Deowongo Incised
Unidentified Tribal
Chance Incised and Unidentified Tribal
Otstungo Notched and Bainbridge Linear
Chance Incised, Otstungo Notched, and Unidentified Tribal
Chance Incised, Durfee Underlined, Unidentified Tribal, and Punctate (?)

Mixed

Owasco Corded Punctate, Late Woodland Plainware and Unidentified Tribal
Deowongo Incised and Carpenter Brook
Garoga Incised, Owasco, Vinette 1, and Unidentified Tribal

Triangular blanks, cores of raw material, and spalls are the only items to occur as traits common to both the Tribal and Owasco components. However, this is due to the limited size of the sample, and it is probable that all other non-diagnostic items of material culture are conservative enough to have endured with little change from the time of the Owasco occupation until the occupancy of the site by the Indians of the Tribal phase.

There is a notable and a relatively heavy occurrence (11) of netsinkers in the Tribal component, while none can definitely be as-

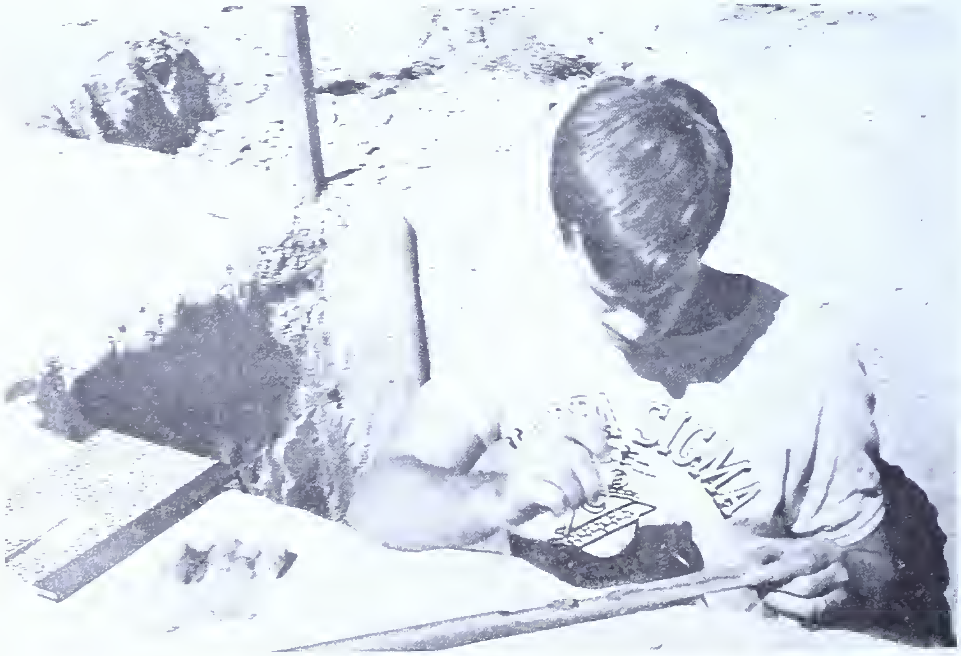


Fig. 87. COLLECTING SOIL SAMPLES FOR POLLEN ANALYSIS at the Camp Ministerium site.

signed to Owasco. This is a shared trait and it is a matter of accident that no netsinkers are attributed to Owasco, since elsewhere they are a known artifact of this culture.

The economic basis of these two components varied little. Corn and bean fragments were found, but these cannot be attributed with certainty to one or the other of the late cultures. Similarly, freshwater mollusks were exploited by each group, although this cannot be positively demonstrated.

Hunting and trapping of wild game was also a shared trait, although of the nine animals represented, only deer can be ascribed with certainty to the Owasco component. Deer bone is the most common of the animal remains and is found in 12 features, with more than two deer represented in two features. Other animals include elk, bear, gray fox, rabbit, raccoon, squirrel, muskrat, turkey, unidentified bird, and a few other unidentified remains. These are animals so commonly a part of the diet of the Indians of the Eastern Woodlands that they must be considered as common to both components.

The following are Owasco and Tribal traits at the Camp Ministerium site:

Owasco

Carpenter Brook
Owasco Corded Punctate
Owasco Punctate
Kelso Corded
Late Woodland Plainware
Bainbridge Linear
Madison and Levanna points
Triangular blanks
Drill
Teshoa
Volcanic tuff (use problematical)

Tribal

Chance Incised
Deowongo Incised
Durfee Underlined
Otstungo Notched
Bainbridge Linear
Punctate (?)
Madison and Levanna points
Triangular blanks
Celt
Cores
Pitted muller
Netsinkers
Deer bone awl
Fossil collecting

Shared Traits

Corn and bean agriculture
Use of freshwater mollusks
Exploitation of common game animals
Digging pits of various forms
Rock-lined cooking hearths
Cup and pin game

Uncertain

Gorget
Notched shale ornament

Most of the earlier diagnostic projectile points lack good context, having been found on the surface, in the topsoil, at the junction of the topsoil and the subsoil, or in a mixed context. For example, a Perkiomen and a Brewerton-like projectile point were found in Feature 8 together with Owasco pottery. Another Perkiomen point was found on the surface. A Lackawaxen point, Straight Stem subtype, was unearthed in Feature 2 with Carpenter Brook and Deowongo Incised sherds.

There are two instances where single diagnostic point types occur in undisturbed situations in the context of a feature, but without related materials. A Lehigh or Perkiomen broadspear blank (Fig. 96 L) of andesite was uncovered in a small saucer-shaped hearth, Feature 6, which contained only a quantity of charcoal and a jasper spall as associated materials. This is similar to a situation at the Peters-Albrecht (36-Pi-22) site, where the base of a fire-spalled Lehigh broadspear was found in a hearth feature that was radiocarbon dated at 1720 B.C. ± 100 years (Kinsey 1968).

A Rossville point of argillaceous shale was found in saucer-shaped Feature 15, which also contained only deer bone and a single chert spall. Together with a few sherds of the Early Series which occur in Feature 25 without other associated materials, these two features and their contents constitute very slender evidence for the presence of the Bushkill complex.

A non-diagnostic ovate flint scraper (Fig. 96 V) was found in the deep test trench at a depth of 35 inches below the surface. No other associated artifacts were found in the vicinity. Other associations of artifacts seem to be very minor and lack significance.

INTERPRETATIONS

The earliest occupation of the Camp Ministerium site is represented by the Lackawaxen and the Macpherson points of the Delaware Valley Archaic complex. This occupation left only a few recognizable traces and apparently lasted for a brief span of time. Brewerton-like points might constitute another minor occupation. In any case Late Archaic use of the site was not intensive and the diagnostic materials lack good context.

The broadspear tradition followed the Delaware Valley Archaic complex, and two Perkiomen points and one broadspear blank are Perkiomen traits. The broadspear blank was associated with a hearth feature, but there is nothing to suggest that the occupation endured for any more than a short passage of time. The probable age range for the Perkiomen component is 1700 B.C. to 1500 B.C.

A postulated component of the Bushkill complex is based upon a single Rossville point and a few weathered sherds of the Early Series of pottery. This occupation is also minor. There are three generalized side-notched points and the base of a straight-stemmed point, which may be part of these previously described occupations or may be indicative of another minor and unrecognized component (s).

The major occupations of the Camp Ministerium site are the Owasco and Tribal components. These components are defined on the basis of two distinctive pottery complexes. The Owasco component includes four Owasco pottery types, Late Woodland Plainware, and possibly Bainbridge Linear. The Tribal component includes Chance Incised and three varieties of this type, Otstungo Notched, a plain ware with V-shaped punctates forming a linear motif, and possibly Bainbridge Linear as a minor conservative trait. The Owasco and Tribal components share such traits as triangular points, blanks, cores, drills, bone awls, mullers, bifacially chipped cutting tools, netsinkers, the cup and pin game, and a fondness for collecting natural objects. Numerous other traits were shared, but were not found here. Both components had an economy based upon agriculture and hunting and gathering. They also prepared pits for storage purposes and for cooking and drying foods.

Based upon dates for similar cultures elsewhere in the Upper Delaware Valley, the Owasco component probably ranges in age from A.D. 1200 to A.D. 1300, while the Tribal component dates A.D. 1400 to A.D. 1450. The latter occupation was slightly more intensive, although permanent house structures were not found.

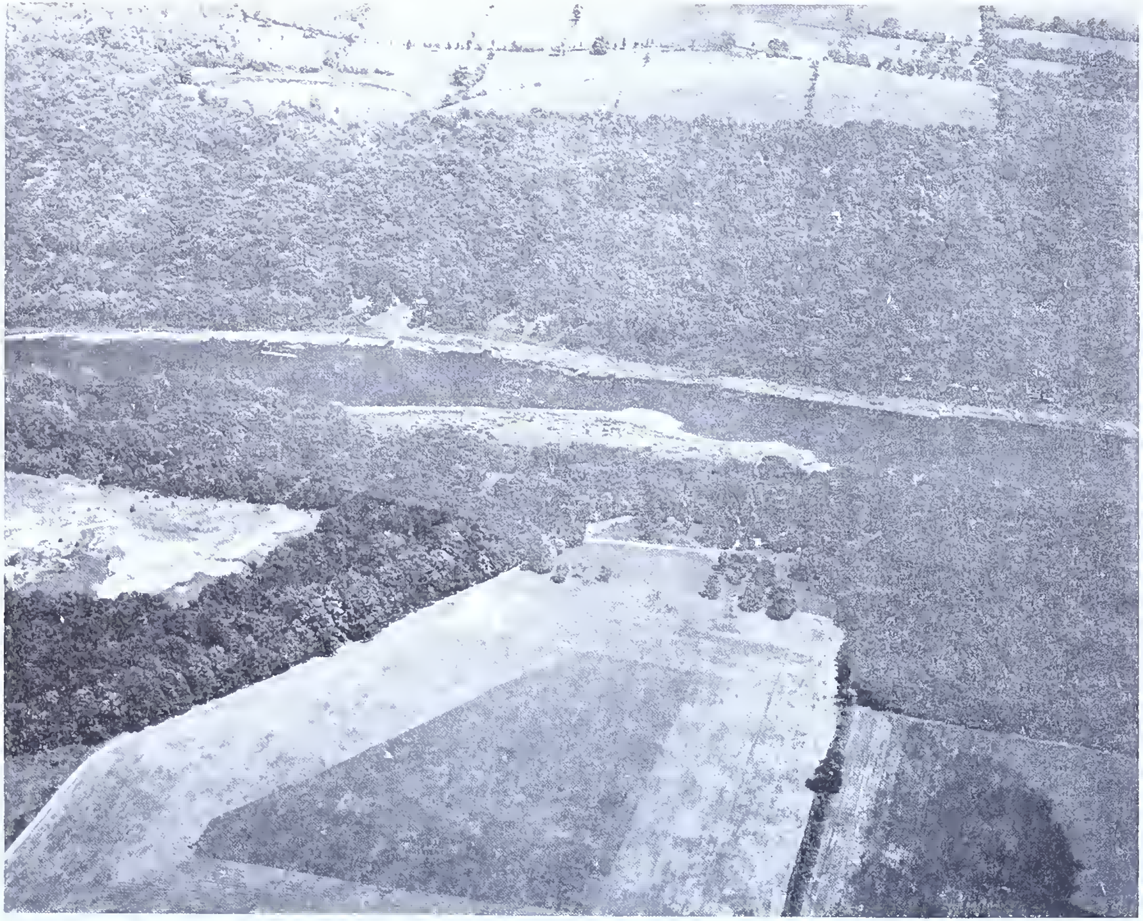


Fig. 88. AERIAL VIEW OF THE LEE'S TERRACE SITE.

Lee's Terrace Site

36-Pi-35

INTRODUCTION

THE Lee's Terrace site is the property of J. Russell Eshback, Bushkill, and can be located at 41 degrees, 09 minutes, and 25 seconds north latitude and 74 degrees, 54 minutes, and 20 seconds west longitude. It is situated on the second to the lowest river terrace, just above the 340-foot contour of a wide flood plain, between 300 and 500 feet northwest of the river bank (Fig. 88). For years the site has been cultivated, although recently the area was allowed to return to weeds. Ninety man-days were spent excavating the site from June 21 to July 3, 1965. The excavation plot consisted of 143 adjacent five-foot squares for a total of 3,575 square feet. Not counted in this total were five test squares made at the site during the 1964 survey. A square 10 feet by 10 feet was dug by six-inch levels to a depth of six feet to test for the presence of more deeply buried occupations. Some evidence for an earlier occupation was found in a compact profile, although natural stratification was absent.

FEATURES (FIGS. 89, 90)

There were 18 well-defined pits, and profile drawings were made for 14. The following pit shapes were recorded: basin (2), bell (6), deep basin (4), and saucer (2). Two pits contained freshwater mussel shells, one was lined with bark, and two were sterile. A rock-filled hearth was found at the bottom of Pit 5.

Seventy-two postmolds were present, forming a pattern which suggests the presence of a rectangular structure (Fig. 89). When the site was under excavation it was believed that the pattern represented a longhouse having its longitudinal axis aligned along a northwest to southeast line. This possibility could not be explored further because in removing the topsoil the bulldozer accidentally cut too deeply into the subsoil, destroying some of the subsurface features at the southeastern end of the pattern. A lane providing access to the riverfront cottages prohibited exploration of the northwestern end. There is another possible interpretation of the postmold pattern. A longhouse

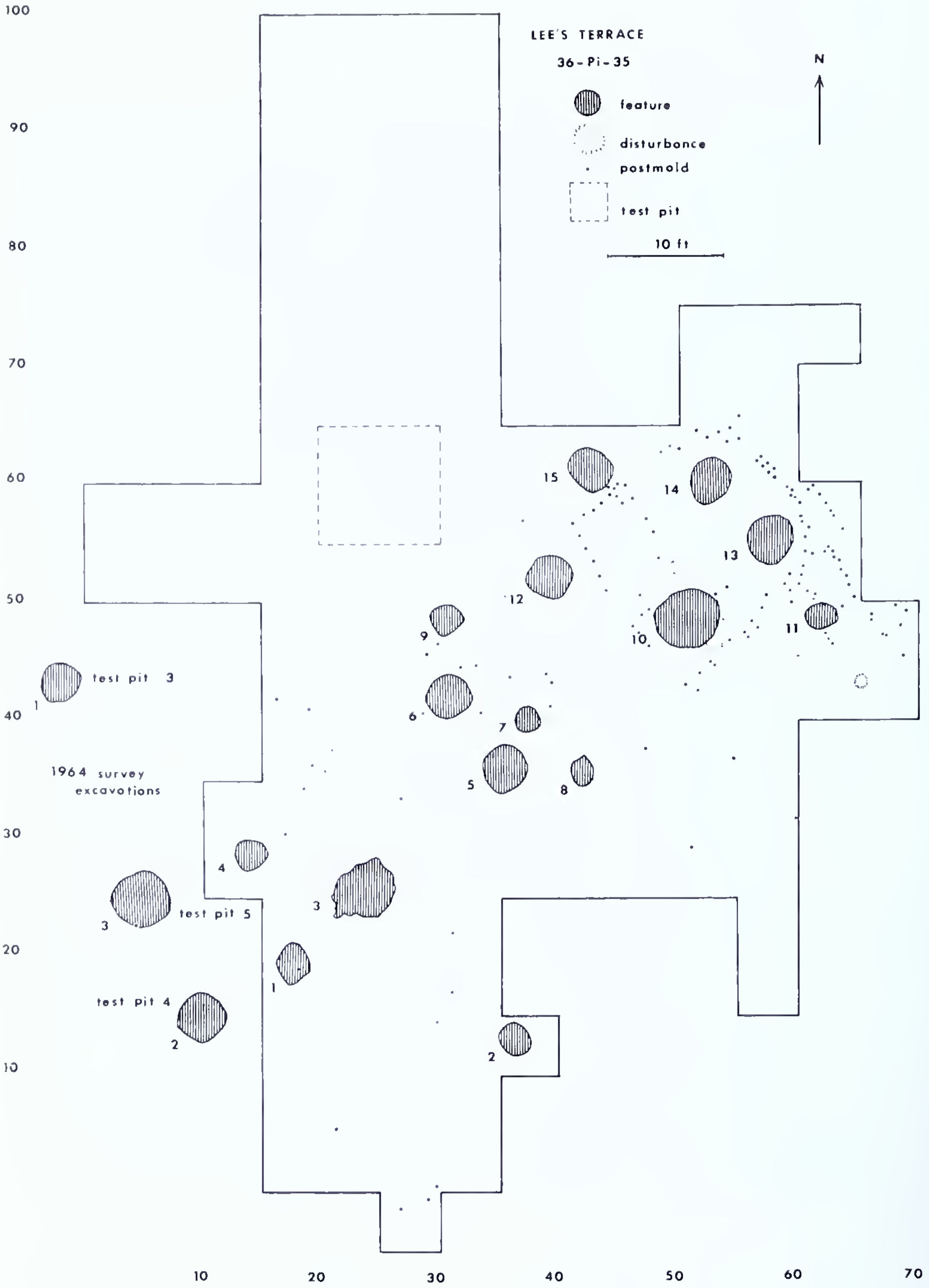


Fig. 89. EXCAVATED AREA OF THE LEE'S TERRACE SITE.

measuring about 70 feet long and 15 feet wide and including within its boundaries 11 pits and perhaps Pits 2 and 3 (located during the 1964 test excavations) might be represented by the distribution of the postmolds and the arrangement of the pits. This postulated house is aligned in a northeast to southwest direction.

The case for either one or the other of the two possible house plans is not demonstrated. In any event it seems likely that some form of a rectangular house structure is present.

CULTURAL MATERIALS

POTTERY

Nearly all of the 607 sherds uncovered from the excavation of the Lee's Terrace site are smooth body sherds from Tribal vessels. Unfortunately, most of the incised rims are too fragmentary to permit identification of the type, and consequently many of the incised rims can only be referred to as unidentified Tribal. For this reason frequency percentages are not calculated.

Early Series	
Unidentified	1 body sherd
	Estimated Number of Whole Vessels Based Upon Rim Sherds
Intermediate	
Bainbridge Linear	1 (Fig. 85 N)
Tribal	
Bowman's Brook Incised (possible)	4
Munsee (possible)	3
Unidentified Tribal	11
Other	
Late Woodland Plainware-Ministerium Variant	1
Untyped Punctate	1
Unknown	2
Total	23

There were fragments of two pipe stems and a crude clay bead. The latter measures .8 of an inch in diameter and .52 of an inch in thickness.

PROJECTILE POINTS—25

The following projectile point types were found at the Lee's Terrace site:

Late Woodland
  Madison—5 (Fig. 91 X)
    Lithic preference
      Flint 5

Levanna—2 (Fig. 91 Y)	
Lithic preference	
Flint	2
Elongate Triangular—1 (Fig. 91 Z)	
Lithic preference	
Flint	1
Early Woodland—Fishtail Tradition	
Orient—2 (Fig. 91 CC, GG)	
Lithic preference	
Chert	1
Jasper	1
Late Archaic—Broadspear Tradition	
Perkiomen—1 (Fig. 91 HH)	
Lithic preference	
Jasper	1
Late Archaic Delaware Valley Archaic Complex	
Lackawaxen Straight Stem Subtype—1 (Fig. 91 EE)	
Lithic preference	
Argillaceous Shale	1
Lackawaxen Converging Stem Subtype—1 (Fig. 91 UU)	
Lithic preference	
Shale	1
Late Archaic	
Normanskill-like—2 (Fig. 91 BB, DD)	
Lithic preference	
Argillaceous Shale	1
Chert	1
Other Archaic	
Small Corner-Removed—2 (Fig. 91 FF)	
Lithic preference	
Chert	1
Flint	1
Milanville—1 (Fig. 91 AA)	
Lithic preference	
Argillaceous Shale	1

There are six tips and midsections of projectile points which are too fragmentary to classify. Two triangular blanks are present.

Chipped	
Projectile Points (including 6 fragments)	31
Triangular Blanks	2
Knives	5
Netsinkers	3
Choppers	5
3 Cores, Spalls: Flint 223, Jasper 40, Shale 39, Argillite 29, Chert 21, Quartzite 7, Other 3	
Total	46
or 75.4% of the sample	

Three knives are crescent-shaped, ulu-like implements of argillaceous shale. The choppers are mostly of siltstone, although there is one specimen of quartzite. These tools have all been used fairly heavily.

Ground and Pecked

Pestle	1	
Celts	4	(Fig. 97 K, N)
Engraved Stone	1	(Fig. 97 L)
Total	6	
or 9.8% of the sample		

The pestle and two of the celts are unfinished. The engraved stone has cross-hatched lines which are underlined by two lines, and the design is repeated on both sides. This engraving is almost an imitation of the decorative motif found on some Tribal pottery.

Altered by Usage

Honing Stone	1
Shell Opener	1
Tongue-Shaped Smooth Implement	1
Chipped and Battered (use problematical)	6
Total	9
or 14.8% of the sample	

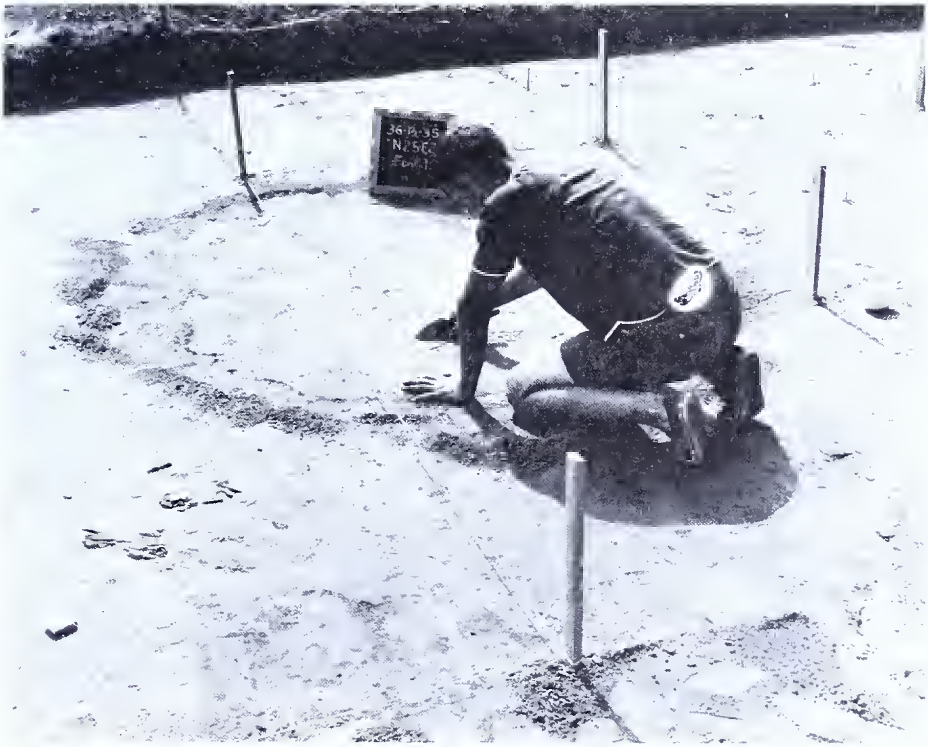
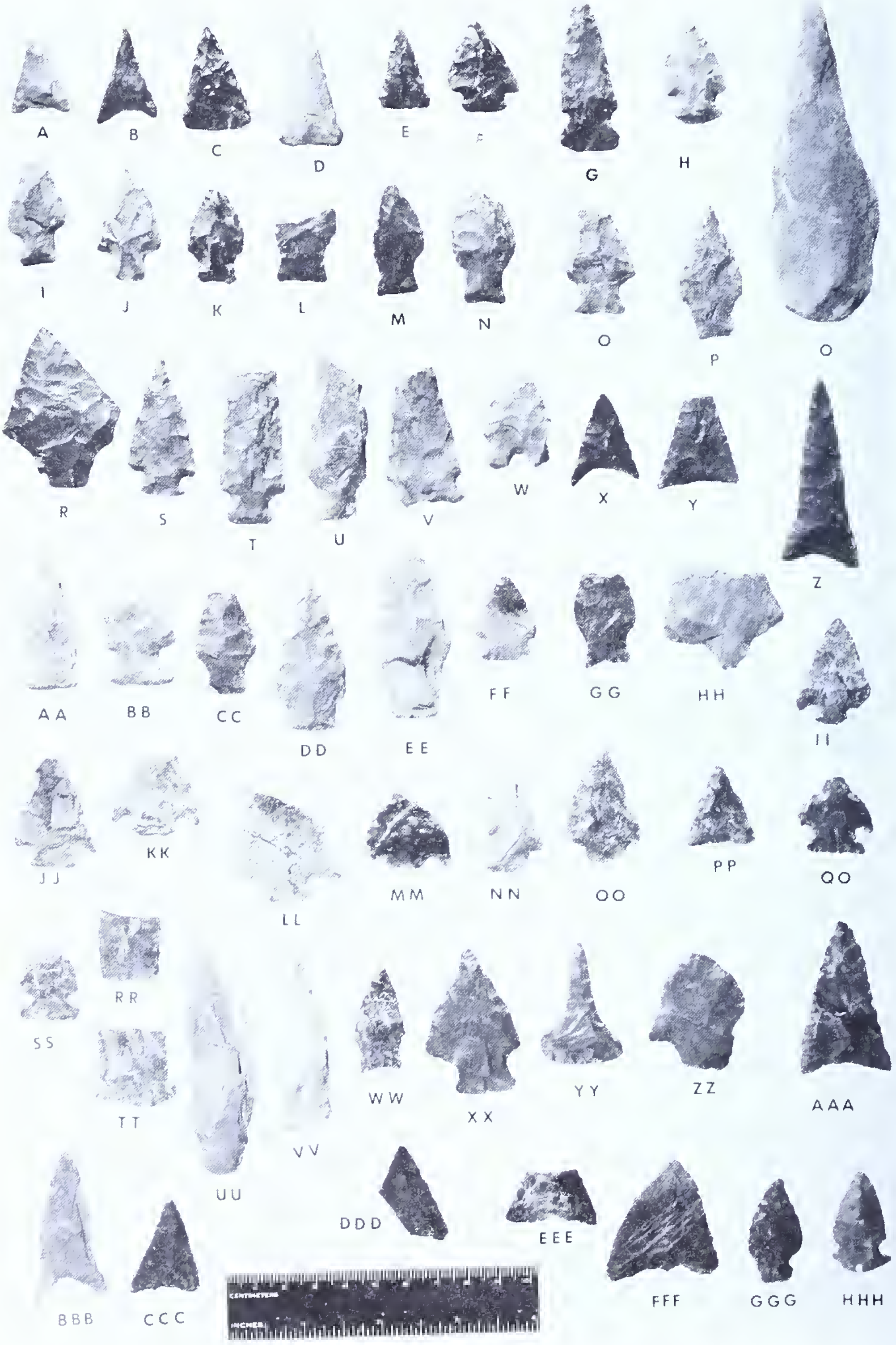


Fig. 90. VIEW OF BARK-LINED PIT, Feature 1 at the Lee's Terrace site.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BBB
CCC
DDD
EEE
FFF
GGG
HHH
CENTIMETERS
INCHES

A sandstone tongue-shaped implement, about five and a half inches long, is well worn on both sides. It was probably used as a smoothing tool, possibly as an implement employed during the preparation of hides.

Other

Steatite Bowl Fragment .... 1 (Fig. 97 M)

A smoothed and polished piece of soapstone is probably from a thick-walled soapstone bowl.

ASSOCIATIONS

Except for sterile Pits 2 and 3, and Pit 9, which contained only charcoal, pottery and stone artifacts occurred in all pits. Tribal pottery was found in 11 pits, with at least seven of these aligned along

←

Fig. 91. PROJECTILE POINTS, BLANKS, DRILLS, AND KNIFE from McCann, Lee's Terrace, Brodhead, and Kutay sites. McCann I site: A, Madison point, chalcedony; B, Madison point, Feature 7, flint; C, Meadowood point, Pit 6, flint; D, Milanville point (?), argillaceous shale; E, Meadowood point, Feature 10, chert; F, small corner-removed point, surface, flint; G, untyped point, Pit 12, chert; H, generalized side-notched point, chert; I, generalized side-notched point, Pit 6, argillaceous shale; J, small corner-removed point, surface, argillaceous shale; K, Dry Brook-like point, Pit 50, jasper; L, Orient point, trench, flint; M, Orient point, Pit 27, flint; N, Orient point, strike-a-light, surface, chert; O, Dry Brook point, trench, argillaceous shale; P, Dry Brook point, trench, flint; Q, knife, trench, argillaceous shale; R, Lehigh broadspear (unfinished), surface, jasper; S, Normanskill point, Pit 5, chert; T, Lackawaxen Expanded Stem point, Pit 46, argillaceous shale; U, Lackawaxen Straight Stem point, Pit 15, argillaceous shale; V, Otter Creek point, trench, argillaceous shale; W, bifurcate-stemmed point, 11″, chert. Lee's Terrace site: X, Madison point, Feature 14, flint; Y, Levanna point, Feature 17, flint; Z, elongate triangular point, Feature 5, flint; AA, Milanville Side-notched point, 8″, argillaceous shale; BB, Normanskill-like point, chert; CC, Orient point, chert; DD, Normanskill-like point, topsoil, argillaceous shale; EE, Lackawaxen Straight Stem point, T. P. 4, Feature 3, argillaceous shale; FF, small corner-removed point, topsoil, chert; GG, Orient point, 5″-8″, jasper; HH, Perkiomen broad spear (possible), T. P. 5, Feature 3, jasper; II, Eshback point, backdirt, flint; JJ, LL, Eshback point, 5″-9″, argillaceous shale; KK, Eshback point, 3″-7″, argillaceous shale; MM, Eshback point, surface, flint; NN, Eshback point, 16″, argillaceous shale; OO, Eshback point, 5″-9″, flint; UU, Lackawaxen Converging Stem knife, surface, shale. Brodhead site: PP, Madison point, Feature 3, flint; QQ, Jack's Reef Corner-notched point, backdirt, jasper; RR, Meadowood blank (?), T. P. 5, chert; SS, Jack's Reef Corner-notched point, 12″, chert; TT, Meadowood point, backdirt, chert; VV, Orient point, argillaceous shale; WW, Orient point, 8″, flint; XX, Perkiomen broad spear, Floor 2, jasper; YY, drill, backdirt, jasper; ZZ, Lehigh broad spear, surface, jasper. Kutay site: AAA, Levanna point, Feature 75, flint; BBB, large triangular point, Feature 46, shale; CCC, Levanna point, Feature 11, flint; DDD, Levanna point, surface, flint; EEE, Levanna point, T. P. 2, Feature 1, flint; FFF, blank, surface, flint; GGG, side-notched point, 0″-12″, flint; HHH, Meadowood point, Feature 19, Onondaga chert.

a northeast to southwest axis within the one postulated house pattern. Madison points occurred in Pit 14 (3) and Pit 11 (1); Levanna points were found in Pit 13 (1) and Pit 10 (1); the one Elongate Triangular point came from Pit 5; and triangular blanks occurred in Pit 11 (1) and Pit 2 (1). Other pit associations include a pestle, celts, a pipestem, a clay bead, a shell opener, a honing stone, netsinkers, cores, choppers, problematical specimens, and a fossil brachiopod. Organic remains are corn, beans, freshwater mollusks, and mammal (mostly deer).

Bainbridge Linear (Fig. 85 N) was found in Pit 3 (Test Pit 5) and a small unidentified sherd with plain punctates was from Pit 15. Although is is impossible to be certain, these two pottery types may be part of a Late Woodland component preceding the Tribal component.

Five Eshback points (Fig. 91 II-OO) are from an older living surface, and were located 5 to 10 inches below the subsoil. This group of five specimens was found within an area having a radius of about eight feet, while the other two points of this type were from the topsoil. Two ulu-like knives of argillaceous shale were found close to the group of Eshback points.

One Orient point (Fig. 91 GG) is from a 5- to 8-inch depth below the subsoil, while the other point of this type is a surface find. The steatite bowl fragment (Fig. 97 M) is from the topsoil. A possible Milanville point (Leslie 1967c) was located eight inches below the subsoil. The broadspear basal fragment came from a pit in mixed context with late pottery, and a similar situation holds for the Lackawaxen Straight Stem point. All other point types are found either on the surface or in the topsoil. The culture-bearing stratum is too compact to determine the relationships of the several mixed Late Archaic components.

Interpretations

The Late Archaic at the Lee's Terrace site is represented by a mixed assemblage which includes seven Eshback points, two Lackawaxen points, possibly two Normanskill-like points, and three crescent-shaped ulu-like knives. These are the only materials sufficiently diagnostic to be assigned to the Late Archaic. Five Eshback points came from a compact occupational zone within 10 inches of the top of the subsoil, while the other Archaic points are derived from mixed contexts.

The small corner-removed points and the Milanville point are putative Archaic specimens which may represent traits of an unknown component (s). A single broadspear, possibly Perkiomen, is the only example of this type. The fishtail tradition is represented by two Orient specimens, one of which has a context similar to the five Eshback points, while the other is a surface find. The steatite bowl fragment may be a trait of an Orient component. The subsoil locus of the one Orient point suggests that more than one component is present in the compact stratigraphic profile. No permanency of occupation is indicated by these finds.

The presence of a single sherd of the Early Series is noted, while sherds of Bainbridge Linear, Late Woodland Plainware, and part of a vessel with a plain punctate motif may represent a possible late Owasco occupation. This material is too limited for further speculation.

The major occupation of the Lee's Terrace site is protohistoric Munsee. This identification is based upon the somewhat tentative identification of the diagnostic pottery types. These are presumed to be Bowman's Brook Incised, Munsee, and unidentified Tribal. This component is responsible for the storage and refuse-filled pits and the postulated longhouse. The economy is based upon agriculture, hunting, fishing, and collecting wild plants and freshwater mollusks. Material culture includes triangular points, blanks, knives, netsinkers, choppers, pestles, celts, engraved stones, honing stones, shell openers, clay pipes and beads, and a variety of chipped and battered stones of problematical usage. The collecting of fossils is noted as a trait for this component. A suggested date is A.D. 1450 to A.D. 1500. No extended span of time is implied nor is there evidence for a large population. The longhouse community may have been a single lineage living on the site for a few seasons while carrying out food production and collecting activities on the surrounding flood plain. Security was evidently not a factor, since the site is not easily defended.

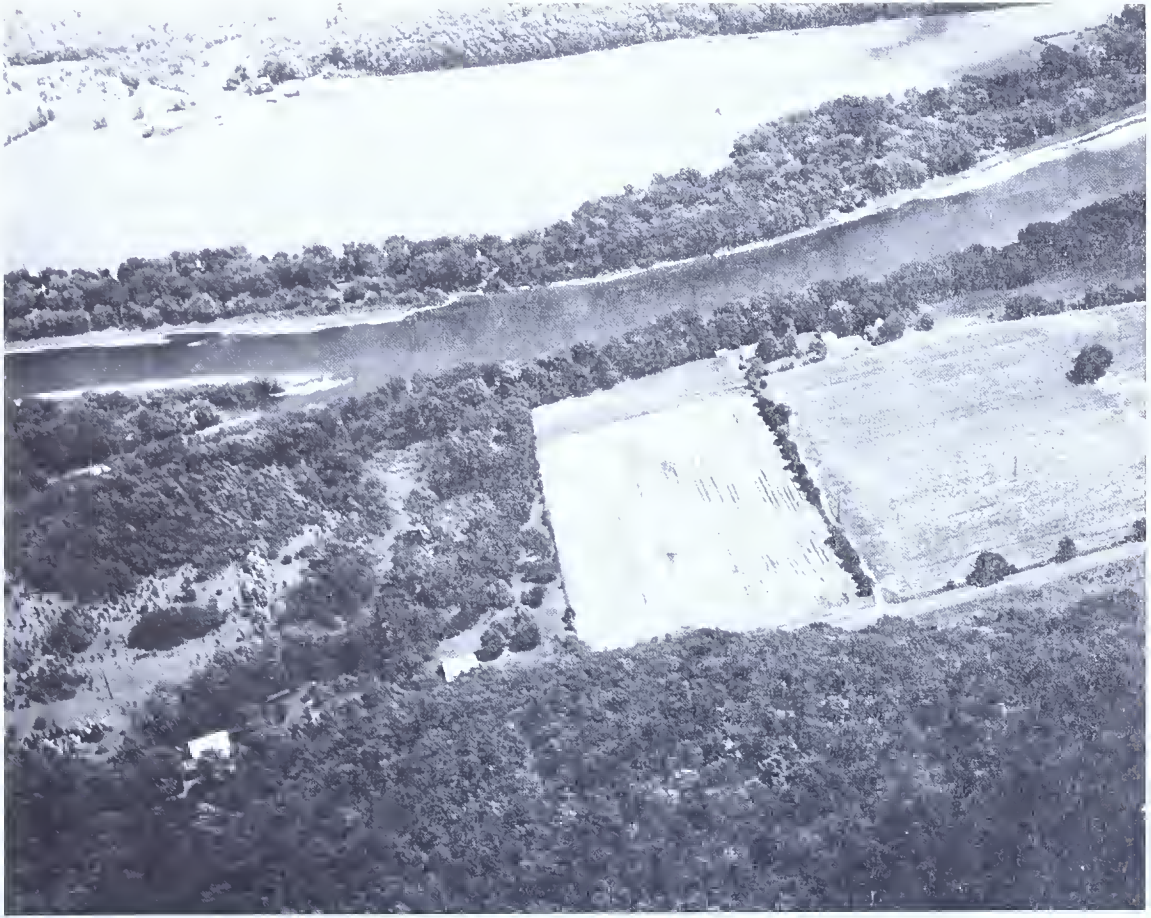


Fig. 92. AERIAL VIEW OF THE McCANN SITE.

McCann Site I

36-Pi-33

INTRODUCTION

THE McCann site is the property of Jackson E. McCann and is situated about five miles south of Dingmans Ferry, Pennsylvania. It can be located at 41 degrees, 10 minutes, and 00 seconds north latitude and 74 degrees, 54 minutes, and 11 seconds west longitude. The site lies to the south of a small stream on the lowest terrace of the flood plain (Fig. 92). In the past the site had been farmed, but in recent years the field has produced a dense cover of weeds. The McCann fields have been popular spots for surface-hunting and indiscriminate pot hunting, and the recent activities of a local collector in exploiting a shell refuse pit were easily detected.

Between July 14 and August 5, 1965, 150 man-days were spent excavating the site. Two plots separated by 100 feet were explored for a total excavation of 5,700 square feet. To test for more deeply buried components, a 10-foot square was dug by six-inch levels to a depth of 60 inches. No trace of occupancy was discovered in the deeper levels.

FEATURES (FIGS. 93, 94)

Fifty-five features were located and excavated. These features include 52 pits which conform to the following profiles: bell (12), saucer (12), deep basin (9), basin (9), shallow cone (3), and cone (2). Profile drawings were not made for five pits. Other features include a hearth and two shallow disturbances. Seven pits and two disturbances were sterile.

A burial containing a badly decomposed skeleton was located in the north excavation plot a few feet east of Pit 39. The grave was extremely shallow; in fact, its maximum depth was only six inches below the plow zone, and a large portion of the skull had been sheared away by the plow. Although the skeletal remains were too fragmentary for positive identification, this appeared to be a flexed adult burial. The long axis was in a west to east direction with the head to the west. There were no grave offerings, and it is impossible to affix cultural identification with any greater precision than the suggestion that this was a Late Woodland interment.

Postmolds are present, but only two configurations create patterns of any possible significance. In the north excavation plot, a group of nine postmolds surrounds Pit 7, while on the east side of the same pit there is a semicircular pattern having a diameter of about seven feet (Fig. 93). This pattern of postmolds surrounding pits and hearths is a trait of several Late Woodland components in the Tocks Island Reservoir. The semicircular postmold plan is probably too small to represent a permanent house, although it might have been a tempo-

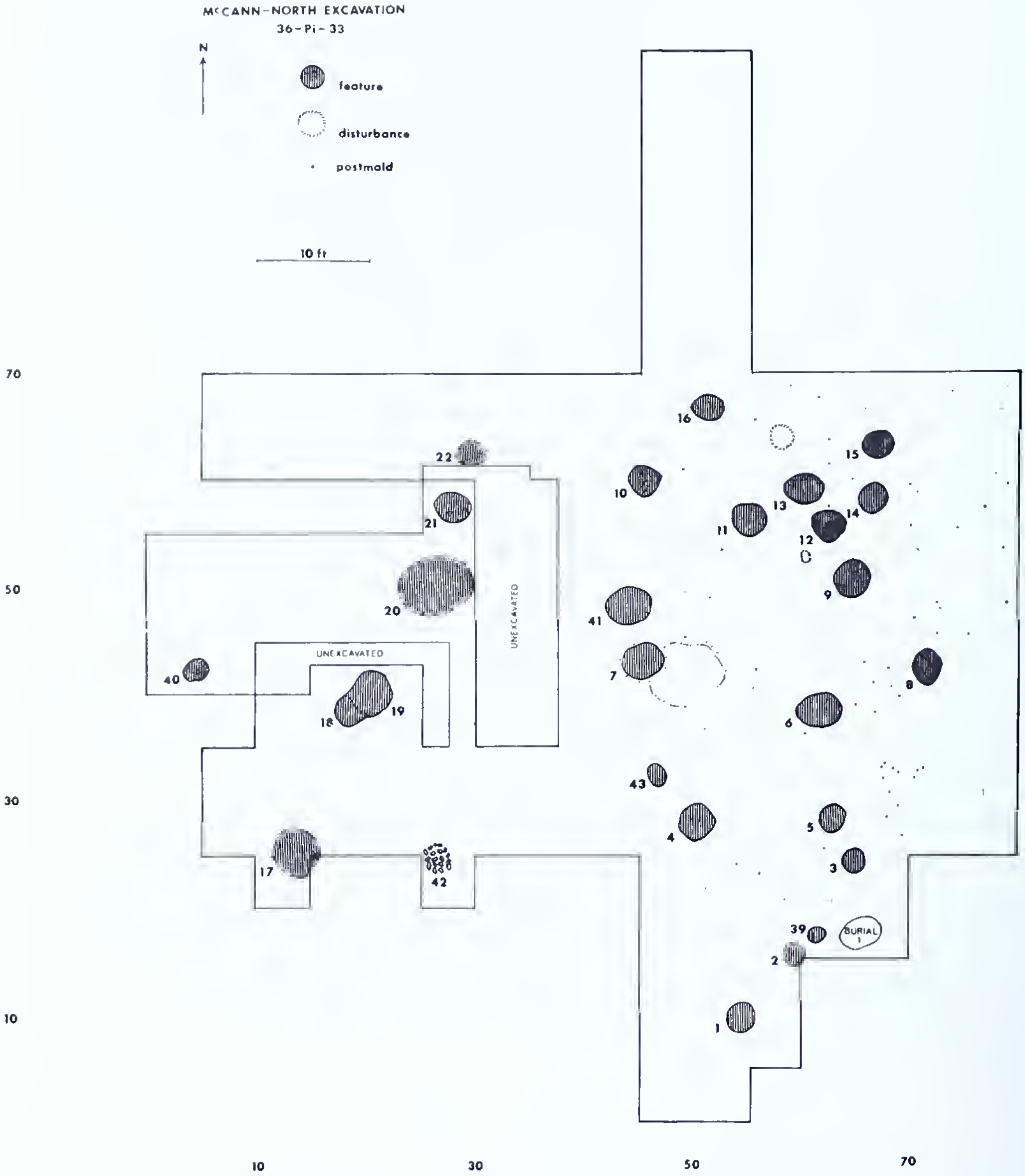


Fig. 93. NORTH EXCAVATED AREA OF THE McCANN SITE.

rary shelter. East of Pit 9 and north of Pit 8, several postmolds form an arc with a diameter of about 10 feet.

CULTURAL MATERIALS

POTTERY

Seven hundred and thirty-eight sherds comprise the ceramic series from the McCann I site. The following types are present:

Early Series	
Exterior Corded/Interior Smoothed	1 rim sherd 4 body sherds
Wiped (Fig. 85 D interior)	9 body sherds
Fabric-Impressed	4 body sherds
Dentate-Stamped	2 rim sherds 68 body sherds

	Estimated Number of Whole Vessels Based Upon Rim Sherds		
Owasco—7			
Kelso Corded	3	18.8%	
Owasco Corded Punctate	2	12.4%	
Sackett Corded	2	12.4%	
Other—1			
Late Woodland Plainware	1	6.3%	
Intermediate—1			
Bainbridge Linear	1	6.3%	
Tribal—7			
Deowongo Incised	3	18.8%	(Fig. 85 C)
Munsee Incised	2	12.4%	(Fig. 85 I)
Bowman's Brook Incised	1	6.3%	
Proto-Susquehannock/Munsee	1	6.3%	(Fig. 74 F)
Unidentified Tribal	3		
Total	19		

PROJECTILE POINTS—51

Late Woodland

Madison—11 (Fig. 91 A, B)

Lithic preference	
Flint	5
Chert	2
Chalcedony	2
Quartz	1
Rhyolite	1

Levanna—5

Lithic preference	
Flint	3
Chert	2

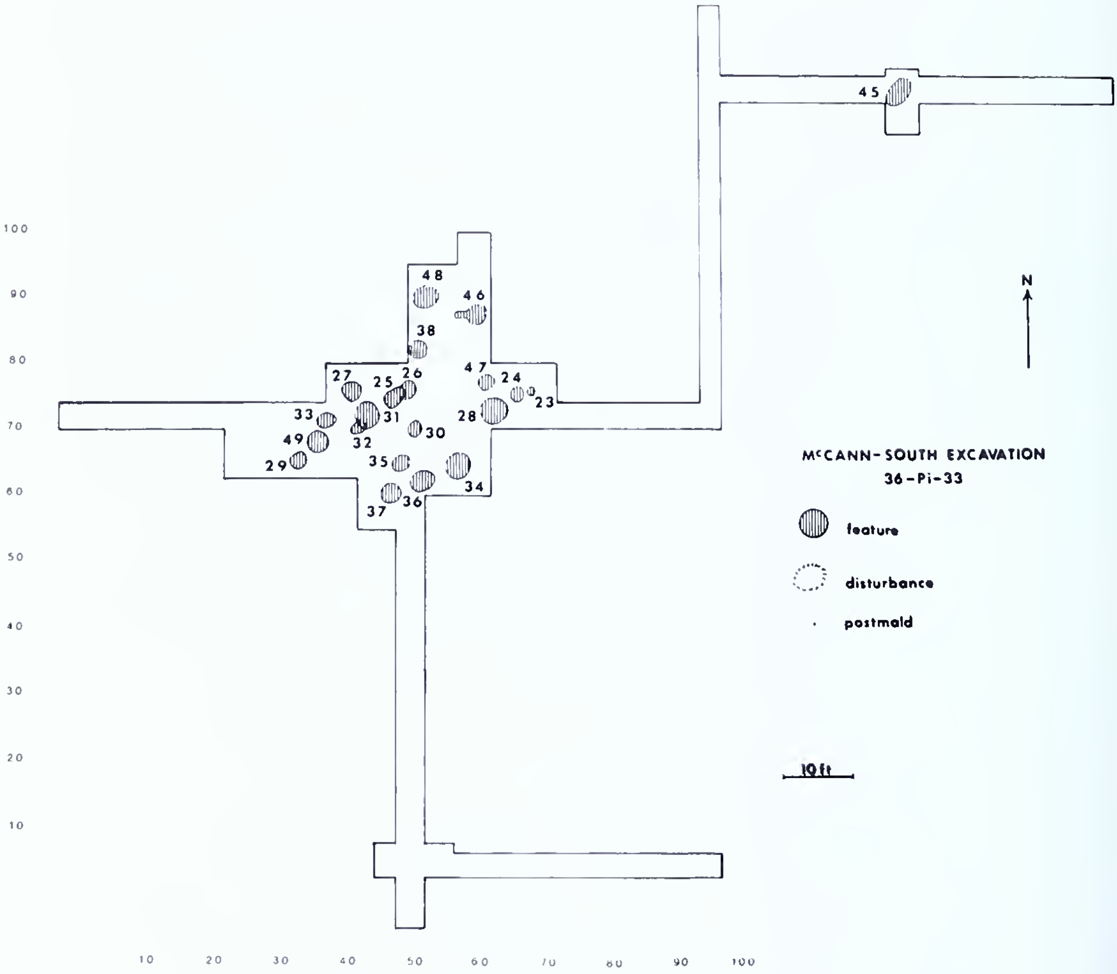


Fig. 94. SOUTH EXCAVATED AREA OF THE McCANN SITE.

Early Woodland	
Meadowood—2 (Fig. 91 C, E)	
Lithic preference	
Onondaga chert	1
Flint	1
Orient—Fishtail Tradition—7 (Fig. 91 L-N)	
Lithic preference	
Flint	5
Chert	2
Late Archaic—Fishtail Tradition	
Dry Brook—4 (Fig. 91 O, P)	
Lithic preference	
Flint	1
Argillaceous shale	1
Jasper	1
Chert	1

Late Archaic—Broadspear Tradition	
Lehigh—2 (Fig. 91 R)	
Lithic preference	
Jasper	1
Argillite	1
Late Archaic—Delaware Valley Archaic Complex	
Lackawaxen Straight Stem Subtype—3 (Fig. 91 U)	
Lithic preference	
Argillaceous shale	3
Lackawaxen Expanded Stem Subtype—2 (Fig. 91 T)	
Lithic preference	
Argillaceous shale	2
Late Archaic	
Lamoka-like—1	
Lithic preference	
Chert	1
Normanskill—1 (Fig. 91 S)	
Lithic preference	
Chert	1
Brewerton Eared Notched—1	
Lithic preference	
Argillite	1
Vosburg—1	
Lithic preference	
Quartzite	1
Otter Creek-like—1 (Fig. 91 V)	
Lithic preference	
Argillite	1
Bifurcate Stemmed—1 (Fig. 91 W)	
Lithic preference	
Chert	1
Other	
Small Corner-Removed—4 (Fig. 91 F, J)	
Lithic preference	
Argillaceous shale	2
Flint	1
Chert	1
Small Stemmed—1	
Lithic preference	
Argillaceous shale	1
Milanville Side-Notched-like—1 (Fig. 91 D)	
Lithic preference	
Argillaceous shale	1
Generalized Side-Notched—2 (Fig. 91 H, I)	
Lithic preference	
Argillaceous shale	1
Chert	1
Untyped—1 (Fig. 91 G)	
Lithic preference	
Chert	1

There are tips and midsections of 23 additional specimens which are too fragmentary to classify, five blanks, and seven triangular blanks.

OTHER STONE TOOLS

Chipped		
Projectile Points (including 23 fragments)	74	
Triangular Blanks	7	
Blanks	5	
Knives	1	(Fig. 91 Q)
Netsinkers	12	
Notched and Trimmed Implements	5	
Teshoas	3	
Choppers	2	
Notched Spearthrower Weight (possible)	1	
20 Cores and blocks of raw material. Spalls: Flint 390, Chert 220, Argillite 128, Jasper 54, Argillaceous Shale 39, Chalcedony 38, Quartzite 3		
Total	110	
or 89.3% of the sample		
Ground and Pecked		
Gorget (possible)	1	
Pestle	1	
Gouge	1	(Fig. 97 J)
Celt	1	
Total	4	
or 3.3% of the sample		
Altered by Usage		
Shell Openers	3	
Honing Stone	3	
Roughly Battered (use problematical)	3	
Total	9	
or 7.4% of the sample		
Other		
Quartz Crystal	1	
Fossil Brachiopod	1	
Graphite	1	

ASSOCIATIONS

A variety of Archaic and Early Woodland projectile point types occurs at the McCann I site, but there are no apparent associations useful for the interpretation of this material. These earlier occupations lack depth and feature context. Mostly these diagnostic artifacts were found in the topsoil, or at the top of the subsoil in extended trenches. In other instances they were mixed with Late Woodland items in the midden-filled pits.

A few sherds of the Early Series (Exterior Corded/Interior Smoothed, Wiped, Fabric-Impressed, and Dentate-Stamped) were found in Pit 16, a deep basin-shaped pit, with a possible gorget fragment and a quartz crystal. A Meadowood point (Fig. 91 C) was found about seven feet distant from Pit 16 in another subsurface feature. Possibly the Meadowood point and the pottery are associated. Outside the main excavations, in Feature 51, were three body sherds of Exterior Corded/Interior Smoothed. No associations are suggested by this material or its locus.

A great majority of the pits pertain to either Owasco or Tribal components. With the exception of seven sterile pits, nearly all contained some non-diagnostic material such as spalls, utilized heavy spalls and choppers, animal bone, freshwater mollusk shell, charcoal, and fire-cracked rocks.

Pits 1, 7, 23, and 48 contained Owasco pottery. Owasco Corded Punctate and Sackett Corded occurred as single pottery types in individual pits, while Kelso Corded and Bainbridge Linear were together in Pit 7. This pit, with the encircling postmold pattern, is adjacent to a small circular pattern defined by a group of postmolds. A Madison point (Fig. 91 B) was found in the latter pit together with seven netsinkers, a possible shell opener, a triangular blank, a lump of graphite, several rough cutting, chopping or scraping implements, and small unidentified animal bones. Mixed with the contents of this Owasco pit were some unrelated projectile points, small corner-removed and Lamoka-like. Pit 7 also contained a quantity of charcoal and fire-cracked rock and measured 41 inches in diameter by 30 inches deep. This pit or hearth feature with the associated postmolds, which suggests a rack, may indicate food-drying activities. The reproduction of the drawing (Fig. 102) by John White on page 324 illustrates this procedure in Virginia (Lorant 1946: 198).

Bell-shaped Pit 21 contained the crushed partial skull of a small female black bear, while scattered outside the pit were bone fragments of deer, bear, and turkey. Nearby were sherds of Sackett Corded and Owasco Corded Punctate as well as a Levanna point. Archeological evidence for bear ceremonialism has been recorded for the Owasco culture in New York (Ritchie 1947a: 1950), and there is ethnological documentation for this trait among the Algonkian-speaking tribes of the Northeast (Hallowell 1926) as well as for the local Munsee-Mahican Indians (Speck 1945).

Pit 27 contained a few probable Owasco body sherds, a teshoa, two cores, a notched and trimmed implement, a cup made from the carapace of the box turtle, some deer bone, and the remains of shad, which was probably caught during the spawning run.

Tribal pottery shows the following pit associations: Pit 4, Bowman's Brook Incised; Pit 19, Proto-Susquehannock/Munsee; Pits 20 and 26, Deowongo; and Pit 31, Munsee. There is also an association of Munsee, Deowongo, Durfee, and unidentified Tribal. Pit 20 held a portion of a probable triangular point, the remains of shad, unidentified animal remains, freshwater mollusk shell, and other non-diagnostic items.

No other associations are suggested by pit contents or by horizontal proximity. Certain components tend to group together with some consistency, but there is not sufficient diagnostic pottery to permit a detailed analysis which would assign the many pits to specific components.

Interpretations

The McCann I site was a favored location, and numerous Indian groups were attracted to this spot. Unfortunately, there is an absence of stratigraphy, and there are no clusters of materials around older living surfaces which would assist in the determination of the cultural associations. Because of these shortcomings there is little indication of material culture and economic activities for those cultures. To make assumptions about these matters it is necessary to rely upon information obtained from other sites.

Based upon typological considerations there are three groups of Late Archaic projectile point types. One group is comprised of the Hudson Valley-related point types, Lamoka-like, Normanskill, Brewerton Eared Notched, Vosberg, and Otter Creek-like. The gouge, a surface find, is a diagnostic Laurentian trait, and it is likely to be associated with one or more representatives of this group. The second group consists of the Lackawaxen Straight Stem and Expanded Stem subtypes of the Delaware Valley Archaic complex. The third group is a potpourri of diverse types of uncertain affiliation. These include small corner-removed, Milanville, small-stemmed, bifurcate-stemmed, and generalized side-notched. Obviously mixed assemblages are present, and lacking better data it is impossible to isolate the various components.

The Late Archaic broadspear tradition is represented by two Lehigh points. Four Dry Brook points belong to the early fishtail tradition, while seven related Orient points are a part of the Early Woodland phase of that tradition. The possible notched spearthrower weight, a surface find, may be associated with either of the fishtail components. The Early Series pottery might belong to the Orient or possibly a Meadowood component, which is represented by two projectile points of this type.

There is an apparent hiatus at the McCann site between Early Woodland and Late Woodland. Owasco and Tribal occupations are responsible for the numerous refuse-filled storage pits. The former is recognized by three Owasco pottery types: Owasco Corded Punctate, Sackett Corded, and Kelso Corded. Bainbridge Linear and Late Woodland Plainware are also considered as types of this component. Other traits are trimmed and notched implements, triangular projectile points, shell openers, netsinkers, and rough cutting and chopping tools. A cup made from the box turtle carapace is also a likely trait. The Owasco culture has a balanced economy based upon corn and bean agriculture, hunting, fishing, and the gathering of wild plant foods and freshwater mollusks. There are no definite house patterns, but in one instance there is evidence that an enclosure had been constructed around a storage pit. Estimated dates for the Owasco component are A.D. 1200 to A.D. 1300.

Some form of bear ceremonialism is inferred for Owasco, which is a trait that is shared with Owasco groups in New York and with the historic Algonkian tribes of the Northeast such as Montagnais-Naskapi, Wabanaki, Penobscot, Munsee-Mahican, and others.

The bear was treated with great reverence and respect (Hallowell 1926). Often, the bear was hunted toward the end of winter during hibernation. It was spoken to and called from its den and then dispatched with an axe. The McCann bear skull and the lower jaw are badly crushed and it is possible that this animal had been clubbed to death, although this is not a certainty. Ritchie (1950: 247-9) has noted the ritual clubbing of two bears for Iroquois at the Palmer site, Monroe County, in western New York. Bows and arrows were considered unsatisfactory weapons for killing bear. Tobacco was customarily offered and apologies were made to the bear for the necessity of its death. Rituals were also observed in connection with skinning and eating the animal, and great care was used in the disposal of the bones. Dogs were not permitted to chew bear bone. Particular caution was exercised with respect to the skull, and often it was preserved by placing it out of the reach of scavengers.

Bear remains are relatively rare at archeological sites in the Northeast (Gilday 1961; 1962), and this rarity may be due to the ritualism associated with the disposal of bear bone. An exception to this is the fairly large amount of bear bone found at the Eschelman site in Washington Boro (Guilday 1962: 65-8).

The Tribal component is represented by Deowongo Incised, Bowman's Brook Incised, Munsee Incised, and an unusual pottery variant which combines a Munsee decorative motif with Proto-Susquehannock high-collar vessel form. Also, there are a number of unidentified Tribal sherds which are too fragmentary for assignment to specific types. The Tribal component shares with Owasco most of the items of material culture, and there is evidence for a continuation of the balanced economy and the trends established by the preceding Owasco component. The presence of shad remains indicates fishing activities during the spawning run, and a late spring occupation is suggested, although the occupation is not necessarily limited to this time of year. Estimated dates for the Tribal component are A.D. 1450 to 1550.

Peters-Albrecht Site

Lowest Terrace

36-Pi-21

INTRODUCTION

THE PETERS-ALBRECHT site, 36-Pi-21, lies east of the village of Bushkill, Pennsylvania, between Route 209 and the Delaware River. The site is located at 41 degrees, 05 minutes, and 21 seconds north latitude and 74 degrees, 59 minutes, and 50 seconds west longitude. It is situated on the first terrace of the flood plain, about 28 feet above normal water level. The property is owned by Mrs. Jane Albrecht, née Peters. Locally, both 36-Pi-21 and 36-Pi-22 (located on the second lowest terrace) are referred to as the Peters property because the land has been in the family for several generations. Several other sites are located on this large field. Over the years the area has been actively surface-hunted, and at least three local collections contain numerous items from this field.

Normally the land is farmed, and in recent years it has supported crops of field corn as feed for the abundant deer population. At the time of the excavations, June 14 to July 30, 1966, cornstalks from the previous season and a beginning growth of weeds were the only cover. Topsoil-removal operations took place in the northeastern portion of the property while the excavations were in progress, but this did not interfere with the archeological activities.

Seventy-three adjacent 10-foot squares were excavated for a total area of 7,300 square feet. Five five-foot squares were excavated to depths of 60 inches to test for deeper occupational zones. Two hundred and nineteen man-days were spent excavating the site.

A preliminary report discusses some aspects of the archeological investigations of the Peters-Albrecht sites (Kinsey 1969).

FEATURES (FIGS. 95, 98)

Twenty-seven pits were uncovered and cleared and they conform to the following shapes: saucer (7), basin (3), shallow cone (3), bell (6), cone (4). Profile drawings were not made in four instances. Pits are generally shallow with only five having a depth of 18 inches or greater. There were 53 disturbed areas in the subsoil, of which 43 were found to be sterile.

The most conspicuous feature is 42 (Fig. 98), a large oval rock-filled hearth measuring 22 feet at the widest point and 18 feet at the narrowest width. This hearth occurred at the junction of the topsoil and subsoil. The thickness of the feature ranged from 8 to 15 inches, and it contained a huge quantity of fire-cracked river cobbles.

Two burials were located and excavated. Burial 1 held the badly decomposed skeletal remains of an adult (possibly female) in the flexed position. The long axis of the body was in a north-south direction, with the head to the south. Charcoal and ash were found beneath the skeleton and in the pit fill, suggesting that fire might have been part of a burial ceremony. Another possible interpretation is that as a matter of convenience an available fireplace or open pit was utilized as a grave. Except for a honing stone there were no grave offerings. Two Lackawaxen Stemmed (Fig. 96 KK, LL) points of argillaceous shale were located toward the top of this shallow burial together with a few flint and chert spalls. These items are not considered to be associated with the burial. The Lackawaxen points, Converging Stem subtype, represent the Upper Delaware Valley Archaic complex and belong to a Late Archaic component which was disturbed by the placement of Burial 1. Burial 2 was that of an infant, and because of the fragmentary nature of these remains additional observations are not significant.

Postmolds form two circular patterns having diameters of 20 to 22 feet, with a possible enclosure or extended wall at the entrance. In both instances this "passageway" is on the northwest side of the pattern. These are not entirely convincing house configurations, but inside the postulated houses there are a few sherds, small scattered pieces of charcoal, and some minor disturbances relating to human activities.

Four arcs (Fig. 95) face in opposite directions from one another. These might represent windbreaks or structures of undetermined purpose. It is possible that these arcs are a purely subjective interpretation.

CULTURAL MATERIALS

POTTERY

Two hundred and sixty-six sherds were found during the excavation of the Peters-Albrecht site. For the most part the ceramic collection is represented by very small sherds. Those sherds belonging to the

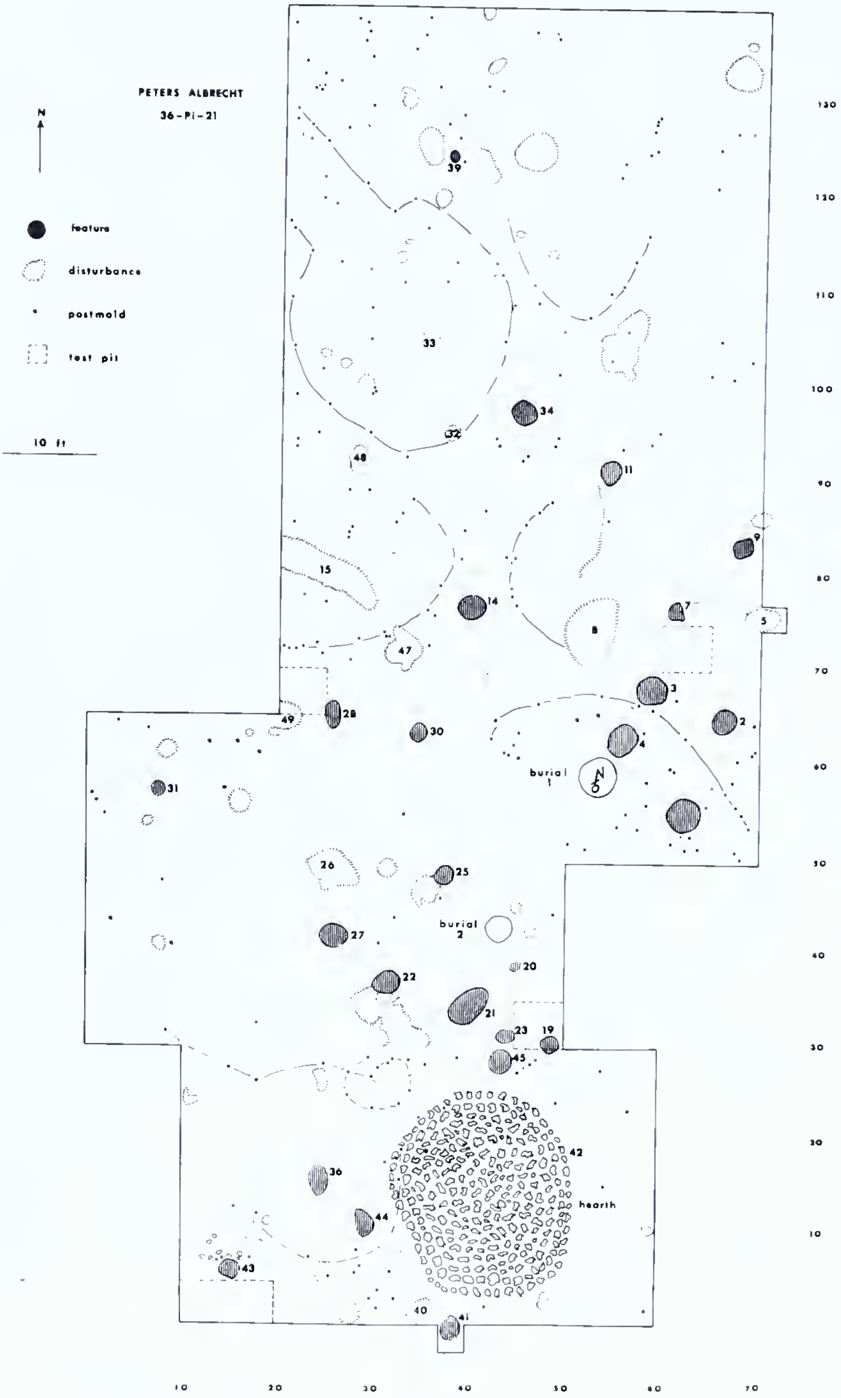
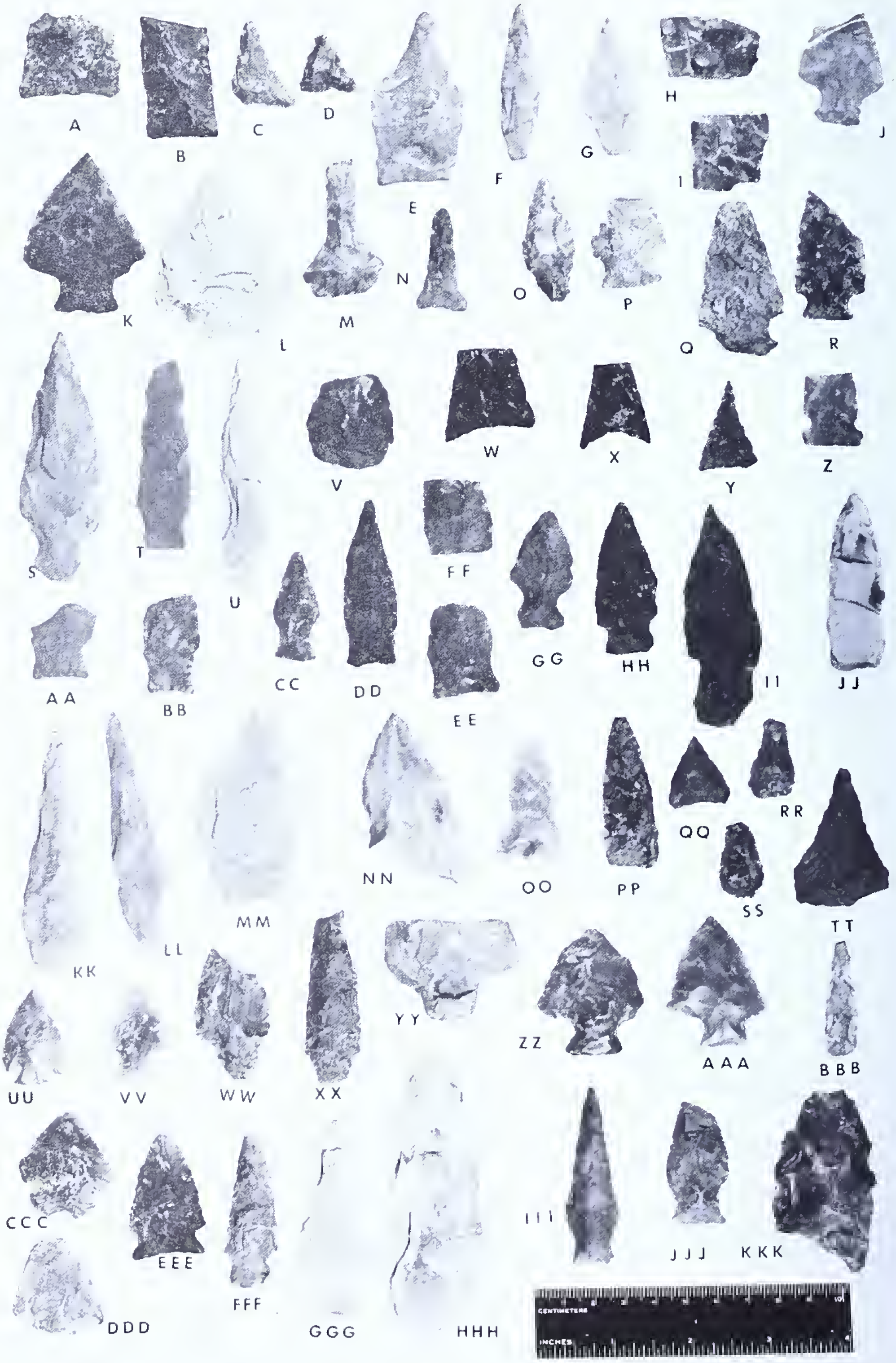


Fig. 95. EXCAVATED AREA OF THE PETERS-ALBRECHT (21) SITE.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III
JJJ
KKK
CENTIMETERS
INCHES

Early Series are particularly small and rather deeply weathered, thus making some identifications somewhat uncertain.

Early Series	
Fabric Impressed	1 rim sherd 31 body sherds
Dentate Stamped	14 body sherds
Vignette I	12 body sherds
Brodhead Net-Marked	2 body sherds
Exterior Corded/Interior Smoothed	1 body sherd
Unidentified	2 body sherds

	Estimated Number of Whole Vessels Based Upon Rim Sherds
Point Peninsula Rocker Stamped	1 (Fig. 85 H)
Owasco	
Kelso Corded	1

←

Fig. 96. PROJECTILE POINTS, BLANKS, KNIVES, DRILLS, AND SCRAPERS from Camp Ministerium, Peters-Albrecht (21 and 22), and Camp Miller sites. Camp Ministerium site: A, unfinished triangular point, 0″-16″, flint; B, triangular blank, T. P. 2, flint; C, Madison point, 0″-16″, chert; D, Madison point 0″-16″, flint; E, F, drill, T. P. 4, Feature 1, argillite; G, Rossville point, Feature 15, argillaceous shale; H, broken blank, T. B. 4, Feature 1, chert; I, broad stem base (?), 0″-16″, jasper; J, Perkiomen broad spear, Feature 8, argillaceous shale; K, Perkiomen broad spear, surface, flint; L, broad spear blank, Feature 6; M, drill, test trench, jasper; N, T-shaped drill, 0″-18″, siltstone; O, Rossville point, 6″-18″, jasper; P, generalized side-notched point, Feature 8, flint; Q, Brewerton point (?), surface, flint; R, generalized side-notched, 0″-12″, chert; S, Macpherson point, 5′ x 20′ trench, south pit, shale; T, Lackawaxen Straight Stem point, test trench, Pit 12, argillite; U, Lackawaxen Straight Stem point, surface; V, scraper, test trench 1, 35″. Peters-Albrecht (21) site: W, Levanna point, surface, flint; X, Madison point (?), surface, flint; Y, Madison point, surface, flint; Z, Raccoon Notched point, Trench 3, 0″-12″, jasper; AA, Orient point, surface, jasper; BB, Orient point, jasper; CC, Orient point, surface, chert; DD, Orient point, 12″ subsoil, flint; EE, Orient point, 18″-24″, chert; FF, blank, Feature 42, jasper; GG, Dry Brook point, Feature 42, chert; HH, generalized side-notched point, surface, flint; II, knife, 12″, flint; JJ, knife, 24″-30″, shale; KK, LL, Lackawaxen Converging Stem points, Burial 1, argillaceous shale; MM, knife, shale; NN, side scraper, surface, jasper. Peters-Albrecht (22) site: OO, elongate triangular point, 12″, chert; PP, blank, Feature 45, flint; QQ, Levanna point, Feature 4, flint; RR, end scraper, Feature 4, chert; SS, end scraper, 12″, flint; TT, Jack's Reef Pentagonal point, Feature 4, flint; UU, Jack's Reef Corner-notched point, topsoil, chert; VV, Normanskill point, Feature 43, chalcedony; WW, Rossville point, Feature 21, flint; XX, Lackawaxen Converging Stem point, Feature 21, flint; YY, Lehigh broad spear, Feature 6, jasper; ZZ, Perkiomen broad spear, topsoil, jasper; AAA, Perkiomen broad spear, Feature 21, chert; BBB, drill, Feature 43, argillaceous shale; CCC, bifuricate stemmed point, topsoil, chalcedony; DDD, Eshback point, 0″-12″, shale; EEE, Vosburg point, surface, flint; FFF, Lamoka-like point, Feature 42, flint; GGG, Lackawaxen Straight Stem point, Feature 42, argillaceous shale; HHH, knife, Feature 27, shale. Camp Miller site: III, Orient point, 16″-28″, chert; JJJ, Dry Brook point, chert; KKK, blank, jasper.

Intermediate	
Bainbridge Interrupted Linear (?)	1
Tribal	
Munsee Incised	1
Unidentified Tribal	8
Total	12

There are also fragments of three clay pipes, but these are unidentified as to type.

Projectile Points—29

Twenty-nine projectile points are sufficiently intact for identification, and there are 10 fragments and tips. Two of the latter may have been used as drills or reamers.

Late Woodland	
Madison—2 (Fig. 96 X, Y)	
Lithic preference	
Flint	2
Levanna—7 (Fig. 96 W)	
Lithic preference	
Flint	3
Chert	3
Jasper	1
Generalized Triangular—2	
Lithic preference	
Flint	2
Middle Woodland	
Raccoon Notched—1 (Fig. 96 Z)	
Lithic preference	
Jasper	1
Early Woodland	
Meadowood-like—1	
Lithic preference	
Flint	1
Early Woodland—Fishtail Tradition	
Orient—8 (Fig. 96 AA-EE)	
Lithic preference	
Chert	4
Jasper	2
Flint	1
Chalcedony	1
Late Archaic—Fishtail Tradition	
Dry Brook—1	
Lithic preference	
Chert	1

Delaware Valley Archaic Complex

Lackawaxen Converging Stem Subtype—3 (Fig. 96 KK, LL)	
Lithic preference	
Argillaceous shale	3
Lackawaxen Straight Stem Subtype—2	
Lithic preference	
Argillite	1
Chert	1

Other

Generalized Side-Notched—2 (Fig. 96 HH)	
Lithic preference	
Flint	2

Other Stone Tools

Classes of stone tools conform to two categories with the Ground and Pecked class not represented.

Chipped

Projectile Points (including 10 tips and fragments)	39	
Bifaces	4	
Blank	1	(Fig. 96 FF)
Knives	4	(Fig. 96 II, JJ, MM)
Scraper	1	(Fig. 96 NN)
Teshoa	1	
Netsinkers (one netsinker is pitted)	22	
Notched and Trimmed Implement	1	
Spalls: Chert 2,043, Jasper 472, Flint 443, Argillite 200, Chalcedony 161, Shale 12, Quartzite 6, Others 14		
Total	53	
or 74.6% of the sample		

Altered by Usage

Mullers and Pitted Implements	7
Milling Stones	4
Hammerstones	2
Honing Stone	1
Natural Cobbles (use problematical)	4
Total	18
or 25.4% of the sample	

Associations

Lackawaxen points of the Delaware Valley Archaic complex lack stratigraphic context. Two were found in the fill of Burial 1, two were from the topsoil, and one was from the 12- to 18-inch level. A trianguloid shale knife (Fig. 96 JJ) of this complex and two flint bifaces (knives?) were found in the 24- to 30-inch level below the Orient component. This was the only evidence encountered which revealed the presence of deeper occupations at the site. It was not

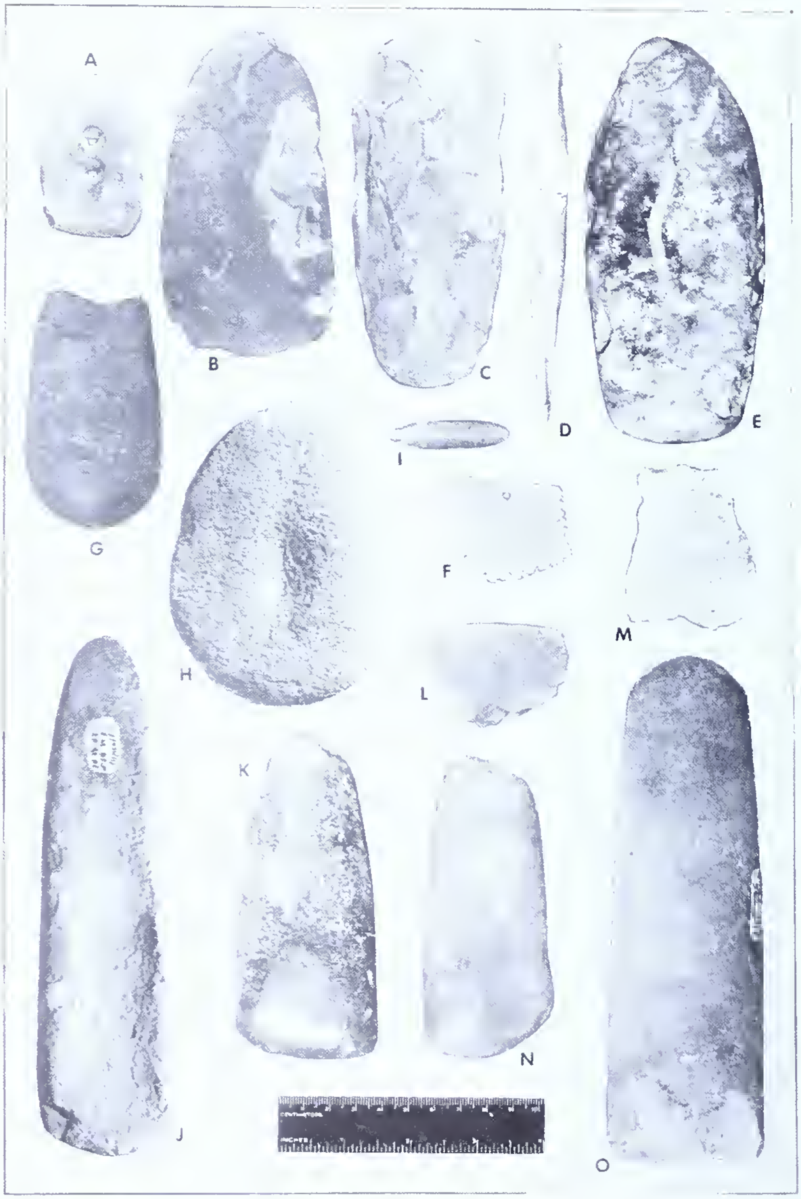


Fig. 97. MISCELLANEOUS ARTIFACTS from Brodhead, Peters-Albrecht (22), McCann, and Lee's Terrace sites: A, gorget, Camp Ministerium, Feature 27, shale; B, celt, Camp Ministerium, H-10, flint; C, chipped celt, Camp Ministerium, Feature 3, shale; D, bone awl, Camp Ministerium, Feature 16, bone; E, celt, Camp Ministerium, north trench, shale; F, notched ornament, Camp Ministerium, T. P. 4, Feature 1, shale; G, celt, Brodhead, Feature 27, siltstone; H, pitted stone, Brodhead, T. P. 4, sandstone; I, pendant, Peters-Albrecht (22), Feature 39; J, gouge, McCann, topsoil; K, celt, Lee's Terrace, Feature 10, siltstone; L, engraved stone, Lee's Terrace, topsoil, siltstone; M, soapstone, Lee's Terrace, topsoil; N, celt, Lee's Terrace, Feature 10, siltstone; O, pestle, Lee's Terrace, Feature 14, siltstone.

possible to carry out further investigation since these materials were found at the termination of the field season.

Feature 42, the large oval hearth composed of fire-cracked rock, is part of a Dry Brook/Orient component. Similar hearths were present at Faucett, Brodhead-Heller, Zimmermann, and Miller Field sites, and these large rock features are a local trait of Orient, Dry Brook, and Perkiomen phases.

Scattered flecks of charcoal were the only trace of fire. Ash was not in evidence. At the time of the excavation there was speculation that the feature might represent a sweat lodge of the Late Woodland period. However, its large size, the associated diagnostic point types, and the identification of similar hearths from other sites preclude that interpretation. Generally, few objects of material culture are found in these hearths and Feature 42 is no exception. Included in the feature were a Dry Brook projectile point made of chert, a scraper, part of a jasper blank (Fig. 96 FF), and three core-like pieces of raw material (jasper, chert, flint). Spalls were present in the following amounts: flint 35, chert 29, jasper 29, argillite 4, chalcedony 3, and quartzite 3. An Orient point was located close by outside the hearth.

Other evidence supporting the identification of the feature is an Orient occupation located 20 feet from its western edge. This component is situated in the southwest corner of the site plot (Fig. 95), and a concentration of material related to this component occurred in the 12- to 18- and the 18- to 24-inch levels. An impressive quantity of workshop debris was found within a five-foot radius. There were 1,991 chert, 381 jasper, 145 chalcedony, 12 flint, and 5 argillite spalls. Abundant spalls of fine-grained flint materials are characteristic of the fishtail and Perkiomen broadspear components at other local sites. The presence of three projectile points of the Orient type contributes to the identification of the cultured affiliation of the workshop. Found in the same area were seven projectile point tips (two or which may have been used as drills), a muller, a scraper, a knife, and a few small unidentifiable body sherds.

Horizontal proximity of an unknown feature to a known feature is not sufficient evidence to assume that the two are products of the same component. For example, Feature 42 (Figs. 95, 98) is believed to be part of an Orient/Dry Brook component. Feature 41, a Munsee pit, is also very close to the hearth, but it seems clear that Features 41 and 42 are unrelated. A portion of the postulated circular house intersects the hearth, but these are considered unrelated. Kelso Corded pottery is found inside the house in Feature 36, while the contents of Feature 44 are not sufficiently diagnostic to contribute to the identification of the component responsible for the postmold pattern.

Feature 33, found within a second postulated circular house, contained two sherds of Brodhead Net-Marked pottery. No other diagnostic artifacts occur inside the pattern, although some few sherds of the Early Series (Fabric-Impressed and Vinette 1) were located in the general vicinity near the exterior of the pattern. This association of a possible circular house plan with Brodhead Net-Marked pottery of the Bushkill complex compares with a similar situation at the Faucett site.

The two circular postmold patterns (Fig. 95), at the Peters-Albrecht site are sufficiently uniform to be considered contemporaneous, although there is a faint hint that the projected house patterns may belong to separate components. Round houses are well known for Owasco, but these are not claimed to be positive features nor are they positively ascribed to a particular occupation. It is conceivable that the several arcs served as windbreaks, but this suggestion is merely mentioned as a possibility.

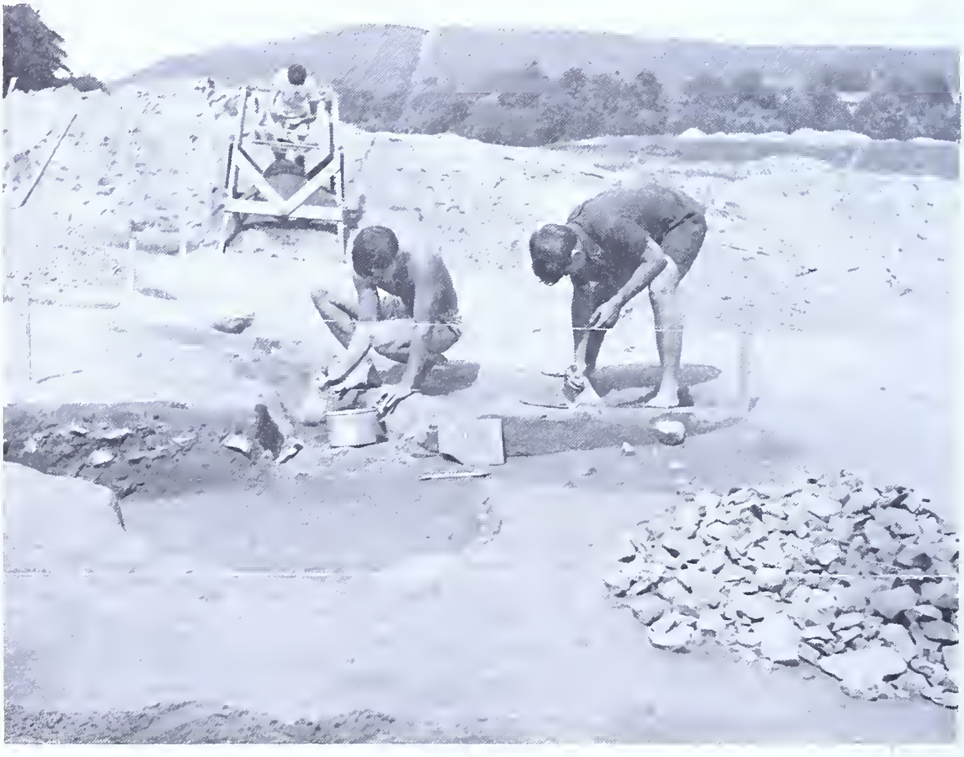


Fig. 98. VIEW OF THE EXCAVATION of Feature 42, the large Orient/Dry Brook hearth at the Peters-Albrecht (21) site.

Munsee and unidentified Tribal pottery, triangular points, food-preparation tools, netsinkers, spalls, charcoal, and other midden debris occur in association in several pits and features. There are insufficient data for other and possibly valid relationships, but the assumption is that the Tribal pottery belongs to a single component. Although very scarce and fragmentary, the only animal remains found relate to the Tribal component. Deer bone occurred in Features 5 and 7, together with unidentified remains, while deer and unidentified bird bones were found in Feature 12. In spite of the lack of evidence for the utilization of freshwater mollusks, it is likely that shellfish were collected and eaten.

INTERPRETATIONS

Several projectile point types are traits of the local Delaware Valley Archaic complex, and most of the material is scattered in the topsoil or found in a mixed context. Had it been possible to continue the excavations, it may be that a component of the complex would have been revealed at deeper levels. The complex is represented by five Lackawaxen type points and perhaps several bifaces and two knives. This occupation is considered temporary and superficial.

Eight Orient points, one Dry Brook point, a workshop, three tips, a scraper, a knife, a muller, and a large rock-filled hearth constitute the evidence for a component of the fishtail tradition. It is uncertain whether a single Dry Brook/Orient occupation or two separate components are represented. Elsewhere in the Delaware Valley, Dry Brook and Orient point types are found as separate occupations and in mixed situations. The occupation shows some indication of permanency and more than casual residency. Pottery of the Early Series implies an occupancy of the site during Early-to-Middle Woodland. Perhaps the generalized side-notched points and the Point Peninsula Rocker Stamped pottery belong to this period. The only other possible diagnostic trait for this component is the Raccoon Notched point. These occupations appear to be brief and superficial.

Late Woodland may be represented by one or two components. Kelso Corded may be a very minor Owasco component or a conservative trait within the Tribal-Munsee component. The latter occupation is probably contemporaneous with a similar component on the second lowest terrace. Most of the pits and cultural materials assigned to this component could be the product of a few individuals over a relatively short time. It is less intensive than the similar occupation on the second lowest terrace, since there are fewer pits and they are more scattered.

Peters-Albrecht Site

Second Lowest Terrace

36-Pi-22

INTRODUCTION

THE PETERS-ALBRECHT site, 36-Pi-22, is situated on the second lowest terrace of the flood plain. It is about 42 feet above normal water level and lies 155 yards northwest of the site on the lowest terrace. Particulars regarding location, ownership, and condition of the field are identical to those described on page 301 for site 36-Pi-21.

Sixty-one 10-foot squares, with minor extensions to accommodate features found along the perimeter of the excavation, were excavated for a total of 6,150 square feet. Five test squares (five feet square) were dug to depths of 36, 48, and 60 inches to determine if deeper occupations were present, but none was found. One hundred and nineteen man-days were spent excavating the site between June 24 and July 26, 1966.

FEATURES (FIGS. 99, 100)

Thirty-three pits were located and excavated. In cross section they have the following profiles: deep basin (8), bell (7), basin (4), shallow cone (4), saucer (3), and cone (1). Profile drawings were not made for six pits. Fifteen disturbances were observed, of which eight were sterile. Several disturbances were the result of groundhogs burrowing through living areas, while others were minor disturbances caused by human activities. There were two charcoal-filled hearths.

There is a negative association for postmolds and pits (Fig. 99). The latter occurred in the southern portion of the excavation in an area 70 feet by 40 feet. There were no intersecting pits. The 75 postmolds generally occupied the northernmost part of the plot. A postmold pattern with a diameter of 15 feet is considered to be the outline of a probable small circular house. Twelve other postmolds forming an arc create a less convincing house plan. The remaining postmolds are randomly distributed.

POTTERY

Most of the 504 pottery fragments are smooth body sherds of which the greatest proportion are from refuse-filled pits. Few rim sherds are

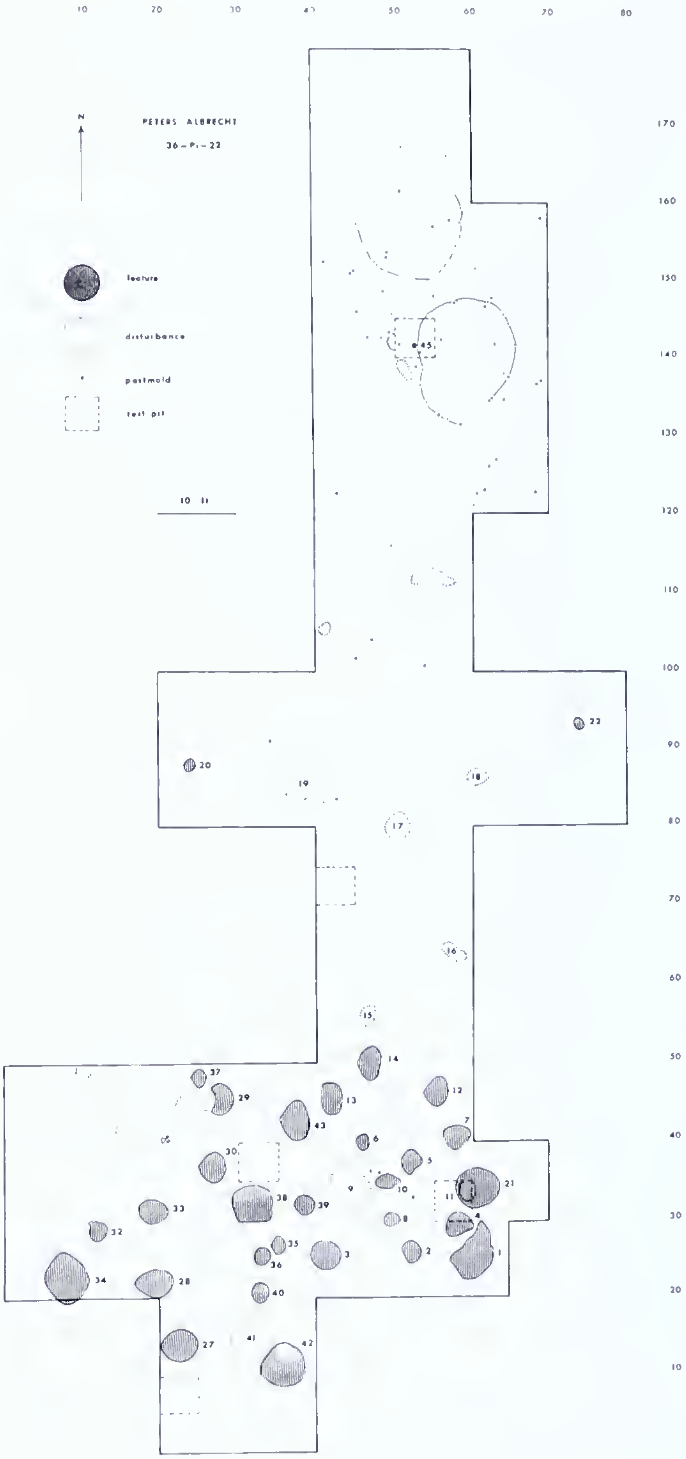


Fig. 99. EXCAVATED AREA OF THE PETERS-ALBRECHT (36-Pi-22) site.

large enough to reveal the overall design motif and, consequently, some of the identifications are somewhat tentative. Corded motifs are present on seven sherds, but because of the small size of these rim sherds it is not possible to determine with certainty whether they represent Owasco or Oak Hill ceramic types. The following types are present:

	Estimated Number of Whole Vessels Based Upon Rim Sherds		
Unknown			
Corded Motif (too fragmentary for identification)	7		
Tribal			
Munsee Incised	5	62.5%	(Fig. 85 F)
Deowongo Incised	2	25.0%	(Fig. 85 E)
Otstungo Notched	1	12.5%	
Unidentified Tribal	13		
Total	28		

Two clay pipe stem fragments are present.

STONE ARTIFACTS

PROJECTILE POINTS—19

Nineteen projectile points are sufficiently intact for typological analysis. They show considerable diversity of types, with no one group or groups of related types predominant.

The projectile point types are as follows:

Late Woodland	
Madison—1	
Lithic preference	
Flint	1
Elongate Triangular—2 (Fig. 96 OO)	
Lithic preference	
Flint	1
Chalcedony	1
Middle Woodland	
Jack's Reef Corner-Notched—1 (Fig. 96 UU)	
Lithic preference	
Jasper	1
Jack's Reef Pentagonal—1 (Fig. 96 TT)	
Lithic preference	
Flint	1

Because the pentagonal specimen has been reshaped as a result of use as a knife, drill, and/or reamer, the identification as to type is tentative.

Rossville—2 (Fig. 96 WW)	
Lithic preference	
Flint	1
Chert	1
Late Archaic-Broadspear Tradition	
Perkiomen—2 (Fig. 96 ZZ, AAA)	
Lithic preference	
Chert	1
Jasper	1
Lehigh—1 (Fig. 96 YY)	
Lithic preference	
Jasper	1
Late Archaic	
Normanskill—1 (Fig. 96 VV)	
Lithic preference	
Chalcedony	1
Lamoka-like—1 (Fig. 96 FFF)	
Lithic preference	
Flint	1
Vosburg—1 (Fig. 96 EEE)	
Lithic preference	
Flint	1
Bifurcate-Stemmed—1 (Fig. 96 CCC)	
Lithic preference	
Chalcedony	1
Delaware Valley Archaic Complex	
Lackawaxen Straight Stem Subtype—1 (Fig. 96 GGG)	
Lithic preference	
Argillaceous shale	1
Lackawaxen Converging Stem Subtype—1 (Fig. 96 XX)	
Lithic preference	
Flint	1
Other	
Generalized Side-Notched—1	
Lithic preference	
Shale	1
Eshback—2 (Fig. 96 DDD)	
Lithic preference	
Argillaceous shale	2

OTHER STONE TOOLS

Chipped		
Projectile Points (including 9 tips and midsections)	28	
Bifaces	10	
Knives	2	(Fig. 96 HHH)
End Scrapers	2	(Fig. 96 RR, SS)
Scrapers	2	
Drill	1	(Fig. 96 BBB)

Graver	1	
Blank	1	(Fig. 96 PP)
Teshoa	1	
Netsinker	1	
Spalls: Chert 523, Flint 519, Jasper 489, Argillite 97, Chalcedony 30, Shale 8, Quartzite 1		
Total	49	
or 51.6% of the sample		

The two small flint end scrapers (Fig. 96 RR, SS) are bifacially chipped, thick and bulbar near the working edge. This is an unusual tool form and these specimens are presumed to be a trait of the Munsee-Tribal occupation. A small thin drill (Fig. 96 BBB) of argillaceous shale is also thought to be a trait of the same component.

Ground and Pecked

Pestles	5	
(including 3 pestles and 10 pestle fragments)		
Celt	1	
Pendant	1	(Fig. 97 I)
Total	7	
or 7.3% of the sample		

Ten pestle fragments are treated as equivalent to two pestles.

Altered by Usage

Mullers and Bipitted Implements	10
Milling Stones	5
Paintstone	1
Hammerstones	2
Anvils	2
Natural Cobbles (use problematical)	19
Total	39
or 41.1% of the sample	

Several pits held small to medium-sized, naturally rounded sandstone and siltstone river cobbles. Some of the cobbles have been spalled, and they may have scars and pits from having been pecked and battered. Their use is problematical.

Associations

The major occupation on the second-lowest terrace of the Peters-Albrecht site is a protohistoric Munsee component. Most of the data pertaining to that component are derived from refuse-filled storage pits. Munsee pottery and unidentified Tribal sherds occur together in Pit 1, while Munsee is the only type found in Pits 3 and 43. Pits 1 and 43 are deep basin-shaped and Pit 3 is cone-shaped. Associated with these features are mullers (2), milling stones (2), a celt, a scraper, a biface, a drill (Fig. 96 BBB), an anvil stone, natural cobbles, a generalized side-notched point, and a Normanskill point (Fig. 96 VV). These projectile points are not considered to be a part of the Munsee component, and their association with the pits is accidental. Also included in these three pits were spalls, charcoal, deer bone, unidentified bird bone fragments, and freshwater mollusk shell. Pit 5 contained a mixture of Munsee Incised (2) (Fig. 85 F), Deowongo Incised (1), and Otstungo Notched (1), as well as small rim sherds with corded motifs (6). This deep basin-shaped pit also held pestle fragments (10), a limonite paintstone, a natural cobble, charcoal, spalls, and deer bone. A Deowongo Incised vessel (Fig. 85 E), occurs as the only type in bell-shaped Pit 7 together with other minor items. A corded rim sherd and a netsinker are from deep basin-shaped Pit 9.

A tiny fragment of a clay pipe bowl with a *pointillé* decorative motif was found in Pit 12 with what are probably Munsee sherds. Other tribal sherds were located in Pits 16, 28, and 38 without diagnostic artifacts. A polished pendant (Fig. 97 I) was found in Pit 39, a small shallow pit. One of the two end scrapers (Fig. 96 RR) was found in Pit 4, together with two natural river cobbles which show some signs of use. Other associations for the Munsee component are minor items.

With one notable exception, associations for the earlier components are mixed or out of context. Most of the diagnostic point types are found either in the topsoil, at the junction of the topsoil and the subsoil, or mixed with the fill in the Munsee pits. Pit 21 is an example of a mixed situation. This deep basin-shaped pit contained a Lackawaxen Converging Stem point (Fig. 96 XX), a Perkiomen broadspear (Fig. 96 AAA), a Rossville point (Fig. 96 WW), an anvil stone, smooth body sherds (8), a quartz crystal, charcoal, spalls, and small unidentified animal remains. Saucer-shaped Pit 42 is also an instance of a late pit containing a Lamoka-like point (Fig. 96 FFF), a Lackawaxen Straight Stemmed point (Fig. 96 GGG), and two Tribal rim sherds. The only reasonable interpretation is that these are disturbed features and that for the most part the associations are accidental.

A noteworthy exception to these mixed associations occurred in Pit 6. This was an ideal situation where a fire-spalled diagnostic point type was found as a single item in a firepit that could be radiocarbon dated. A deep basin-shaped hearth feature contained the fire-spalled base of a jasper Lehigh broadspear (Fig. 96 YY), together with a dense quantity of charcoal. The charcoal was assayed at 1720 B.C. ± 100 years (Y-1826), which provides a secure early date for the Lehigh phase in the Upper Delaware Valley.

INTERPRETATIONS

Extremely minor and transitory Late Archaic occupations are represented by nine diagnostic Late Archaic projectile point types. One group of three types consisting of Normanskill, Lamoka-like, and Vosburg is related to similar local complexes and to others in the Hudson Valley. The Lackawaxen (two) Stemmed points represent the local Delaware Valley Archaic complex. The Eshback and the generalized side-notched points are of unknown affiliation, although the former is probably Late Archaic. Typologically, the bifurcate stemmed point is the earliest artifact on the site.

The broadspear tradition is represented by a Lehigh and two Perkiomen points. The Lehigh phase is radiocarbon dated 1720 B.C. ± 100 years, and this date compares favorably with a radiocarbon date of 1720 B.C. ± 120 years for the mixed Perkiomen/Koens-Crispin component at the Miller Field site. The significance of the Lehigh date has been discussed elsewhere (Kinsey 1968). The Lehigh phase shows enough permanency to be associated with a hearth, while the other diagnostic Archaic points were not found in the context of a feature.

A presumed slight Middle Woodland occupation is represented by

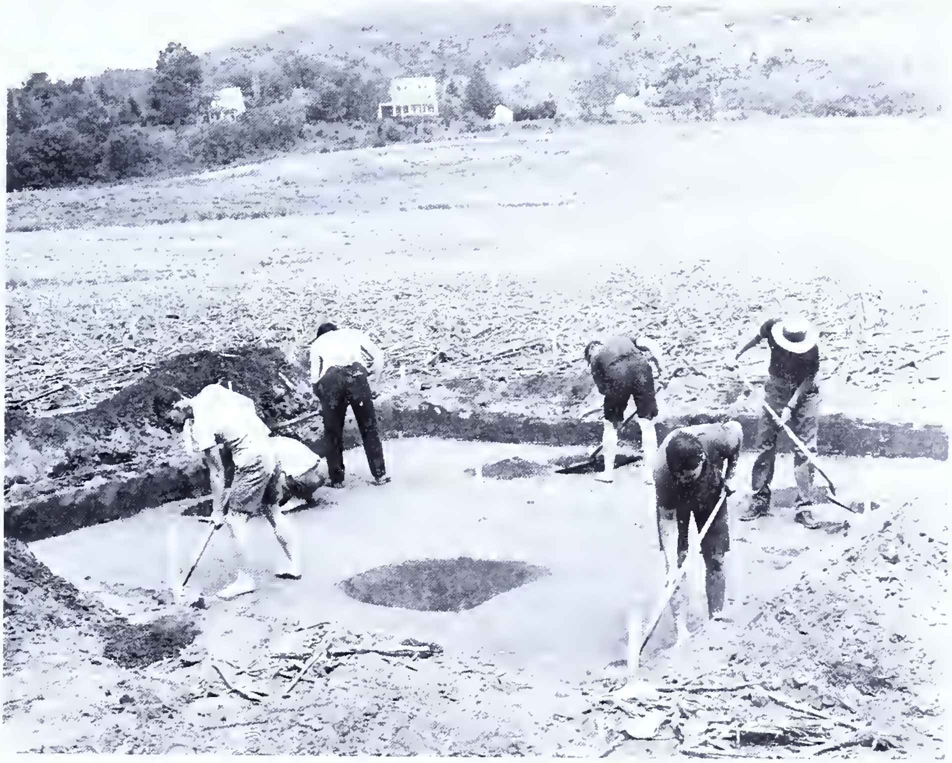


Fig. 100. GENERAL EXCAVATION SCENE at the Peters-Albrecht (36-Pi-22) site.

two Rossville points of the Bushkill complex. There is also a Jack's Reef Corner-Notched and a Jack's Reef Pentagonal of the same period, which may be associated with the Point Peninsula pottery from the occupation on the lowest terrace.

All the aforementioned diagnostic points could have been deposited at the site by small bands of migratory hunters and gatherers. There is no evidence to support any but the most casual occupancy of the site by Indians of Late Archaic and Middle Woodland complexes. The broadspear component appears to have been equally brief.

Munsee Component

The major occupation on the second lowest terrace of the Peters-Albrecht site is Munsee. Most of the pit features and the refuse contents of these pits should be attributed to this component. The pottery complex includes Munsee Incised, Deowongo Incised, and Otstungo Notched, while the inclusion of the corded rim sherds in this component is unlikely. Stone artifacts include triangular points, end scrapers, a graver, a teshoa, a netsinker, pestles, a celt, a pendant, mullers and pitted stones, milling stones, anvil stones, a paintstone, hammerstones, and a variety of natural cobbles of uncertain use. There is a pipe done in a *pointillé* technique and another clay pipe of unknown form. Food resources were local game and freshwater mollusks. Although agriculture was certainly the major source of food, these remains have not been preserved. The postulated circular house probably should not be assigned to the Munsee component.

This component shows no large accumulation of refuse, nor is there any other factor to suggest long-term occupancy. It appears likely that the Munsee lived on the site over a short span of time. The occupancy may have been as short as a single growing season.

Comparison

There are differences as well as similarities between the components found at 36-Pi-21 and 36-Pi-22. The latter site has a greater variety of Late Archaic projectile point types, but there are no fishtail points. In spite of the fact that the Orient/Dry Brook occupation shows some evidence of permanency, the Indians of this tradition apparently made little if any use of the higher ground. Similarly no broadspears were found at 36-Pi-21, but this may be a matter of sample size.

Both sites possess evidence for occupations by people of the Delaware Valley Archaic complex and the Bushkill complex. A more intensive occupation of the higher ground by the Munsee component is noted, even though both sites were utilized by these later Indians.

Camp Miller Site

36-Mr-12

INTRODUCTION

THE CAMP MILLER site is the property of the Eastern Pennsylvania Synod, Lutheran Church in America, and is operated as a summer church camp for boys. Informants report that some 20 to 30 years ago the field was an excellent place for surface hunting, and another source, the Indian Site Survey by the Wyoming Historical and Geological Society, Wilkes-Barre, Pennsylvania, in the early 1930's, records that this site yielded a significant amount of Indian artifacts. More recently, about 1963, a group of campers was reported to have located a quantity of artifacts while digging a tunnel.

Although it was not feasible to conduct extensive excavations and to run tests at scattered locations, the site apparently extends over the lowest and second-lowest terraces. A limited excavation, placed near where the campers had tunneled, was confined to 18 adjacent 10-foot squares for a total of 1,800 square feet. Three test pits (two five-foot squares and one 10-foot square) were excavated to varying depths ranging from 42 to 55 inches to determine if deeper occupational zones were present. Slight evidence of a deeper occupation was found, but it was deemed insufficient to warrant further exploration. Work was carried out from July 19 to 26, 1965. Thirty man-days were spent excavating the site. The site can be located at 41 degrees, 01 minute, and 59 seconds north latitude and 75 degrees, 02 minutes, and 49 seconds west longitude.

FEATURES (FIG. 101)

Thirteen features were excavated. These were two deep basin-shaped pits, a hearth of fire-cracked rock with six postmolds evenly spaced around the perimeter of the hearth, and 11 disturbances, eight of which were sterile.

There were 23 reasonably certain postmolds and 85 less certain ones. A circular configuration of postmolds suggests a small house with a diameter of eight feet. A six-foot projection at the southern end enclosed a disturbance containing a small amount of charcoal. This

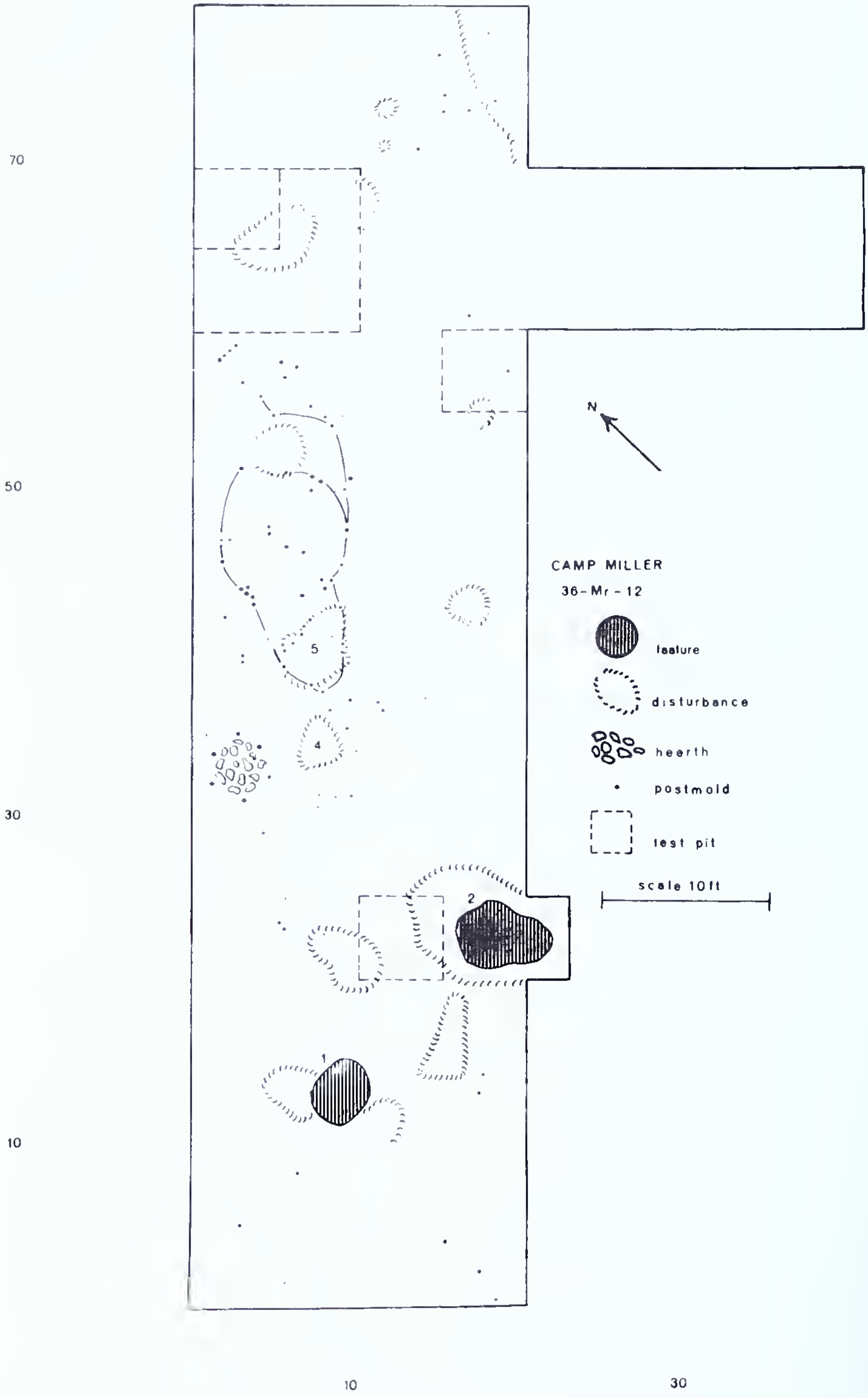


Fig. 101. EXCAVATED AREA OF THE CAMP MILLER SITE.

projection might have been a storage area within the house. At the opposite end there is a suggestion of an entrance with a series of postmolds outlining what may have been a windbreak or a vestibule-like structure. Possibly the latter represents repair or an addition to the house. A disturbed area near the entrance may be the result of repeated passage through the doorway.

Six postmolds encircling a rock-filled hearth having a diameter of three feet are possible evidence for a food-drying rack. This might be the trace of a framework made of green saplings to which were lashed cross members. Shad and other fish, as well as meat, may have been fire-dried, smoked, and preserved on the rack for future use. A sixteenth-century drawing by John White illustrates a fish-drying rack used by the coastal Indians of Virginia (Lorant 1946: 198). A similar feature, Pit 7, was encountered at the McCann site. (Figure 102 is a reproduction of the John White drawing.)

Another possibility is that this feature is a small sweat lodge. Saplings driven into the ground and covered with hides would have made an enclosure. Rocks could have been heated at nearby Feature 4, carried to the lodge and then doused with water in order to produce steam. Sweat lodges are well known in the Eastern Woodlands, and this feature possibly reflects this aspect of Indian life. There was no clue to this rock-filled feature which permitted its positive identification.

No other significant features were located.

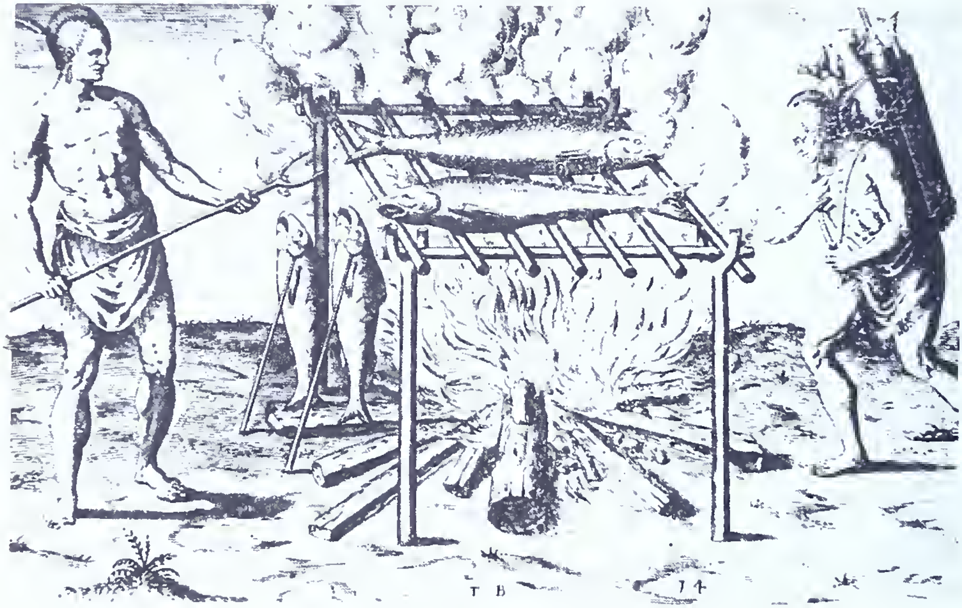
CULTURAL MATERIALS

The Camp Miller site yielded very few artifacts, and only a small percentage are diagnostic.

POTTERY

One hundred and nine sherds consisting of only three recognizable types were present.

	Estimated Number of Whole Vessels Based Upon Rim Sherds
Owasco	
Owasco Punctate	1
Kelso Corded	1
Levanna Corded Collar (?)	1
Unknown	
Corded Motif (too fragmentary for identification)	3
Plain Rim	1
Total	7



Courtesy Smithsonian Institution

Fig. 102. FOOD DRYING RACK AND HEARTH, after engraving No. 14 by DeBry from a John White drawing.

PROJECTILE POINTS—3

The following three projectile points were found at the Camp Miller site:

Late Woodland	
Generalized Triangular—1	
Lithic preference	
Flint	1
Late Archaic to Early Woodland—Fishtail Tradition	
Orient—1 (Fig. 96 III)	
Lithic preference	
Chert	1
Dry Brook—1 (Fig. 96 JJJ)	
Lithic preference	
Chert	1

Chipped		
Projectile Points	3	
Blank	1	(Fig. 96 KKK)
Notched and Trimmed Implement	1	
Netsinker	1	
Spalls: Flint 58, Jasper 48, Chert 4, Argillite 4		
Total	6	
Altered by Usage		
Muller, Bipitted	1	
Total	1	

INTERPRETATIONS

The few diagnostic artifacts found at the Camp Miller site can be assigned to two minor occupations. An Orient/Dry Brook occupation is represented by two projectile points of these types (Fig. 96 III, JJJ), one of which was from the 16- to 28-inch level in one of the deeper test squares, while the locus of the other is from the general excavations. A jasper biface (Fig. 96 KKK) is the only other likely item to belong to this occupation.

The Owasco component probably includes most of the pottery, a triangular point, a netsinker, a notched and trimmed implement, a pitted muller, the rock-filled hearth with the suggested drying rack (or sweat lodge), and the postulated round house. A few unidentified scraps of animal bone suggest hunting activities, while a charred kernel of corn suggests farming.

Over the millennia other groups doubtlessly occupied the site. The excavation was too limited to reveal the presence of other cultures, but it is likely that more extensive excavations would have been successful in uncovering in greater detail the cultural configuration of the various components. Cultural succession and the events of aboriginal occupation of this site are a small part of the prehistory of the Upper Delaware Valley.

Summary

PALEO-INDIAN

EVIDENCE for the Paleo-Indian occupation of the Upper Delaware Valley is provided by both excavated and surface-collected materials. A compact soil profile at the Zierdt site in northern Sussex County, New Jersey, yielded a subsurface Paleo-Indian component which has been reported in detail by Werner (1964). Briefly summarized, this site contained three culture-bearing strata. These are: Zone A, plow zone, 9 to 15 inches thick, bearing a variety of mixed Woodland and Archaic projectile point types and other artifacts; Zone B, reddish-tan sand, 9 to 12 inches thick, also containing a mixed assemblage with a majority representing Laurentian types; and Zone C, light tan sand, 12 to 36 inches thick, containing Paleo-Indian materials at the junction of Zones B and C. A small hearth of river cobbles and two circular charcoal stains, each about 14 inches in diameter, were located in this zone, but no charcoal fragments were present. Eighteen artifacts were found which are believed to pertain to a Paleo-Indian component. These items include a jasper Clovis point with multiple fluting scars, a core or block of raw material from which flakes have been removed, a number of uniface end and side scrapers, and a variety of retouched uniface flakes, most of which experienced some use as cutting implements. Many of the specimens are made from New York flints and contact with the Hudson Valley is indicated.

In a comprehensive study of the Paleo-Indian occupation of the Delaware Valley, Mason (1959) analyzed 98 surface-collected fluted points and fragments from the Delaware River watershed. Two specimens from Mason's sample were found near the Delaware Water Gap, Warren County, New Jersey, and one was found near Coleville, Sussex County, New Jersey. The former are from loci within the Tocks Island Reservoir, while the latter is apparently from the immediate area. One of two other fluted points from Warren County is probably from the reservoir area.

Since the publication of Mason's work, six other examples of fluted point surface finds have been noted for that part of the valley which lies between the Delaware Water Gap and Port Jervis. Leslie (1963b:

33) observes that one example was found near Milford, Pennsylvania, an example was found at the Brodhead-Heller site (Kinsey and Kent 1965: 129; Fig. 63 A, present publication), and two possible specimens are from the Macpherson Collection and were found in the vicinity of Bushkill, Pennsylvania. A Clovis-type point was unearthed at the Pahaquarra Boy Scout Camp site, and another example of this type is reported for the Bell-Philhower site. With the inclusion of the excavated specimen from the Zierdt site, this is a total of 10 or 11 possible fluted points for the Tocks Island Reservoir.

A relatively high number of fluted points has been reported for adjacent areas. To the northeast in the Wallkill and the Dwaarkill valleys of Orange County, New York, there are areas which have yielded an impressive number of mastodon and mammoth remains and fluted points (Ritchie 1965a: 9).

An interesting find by Robert E. Funk, New York State Museum and Science Service, and members of the Orange County Chapter of the New York State Archeological Association occurred at the Dutchess Quarry Cave (Funk and others 1969). This cave is located at Mount Lookout in the black dirt area of the Wallkill Valley, Orange County, New York, between Middletown and Goshen, which is only about 20 miles northeast of Port Jervis, New York. The cave contained three culture-bearing strata.

Two broad, thick, side-notched points, similar to specimens from the deepest levels of the Sylvan Lake rock shelter, were found at the base of Stratum 1B and the top of Stratum 2. These pertain to an Archaic occupation of Dutchess Quarry Cave, and at Sylvan Lake similar projectile forms are radiocarbon dated to 4610 B.C. ± 100 years and 4030 B.C. ± 120 years. The lower level of Stratum 2 yielded a fluted point of Kalkberg flint identified as a Cumberland type, but which has certain Clovis characteristics. Also found in this stratum were caribou bones representing perhaps six individual animals; one bone sample has been radiocarbon dated to 10,580 B.C. ± 370 years. Funk and his associates believe that the caribou bones and the fluted point are contemporaneous and they state that "the Dutchess Cave date must be considered one of the oldest dates so far available for Early Man on the continent. It will be grist to the mill of those students who favor the origin of the fluted point tradition in eastern United States."

For the northwestern portion of the Upper Delaware Valley, Leslie (1963b: 33) indicates that an example of a fluted point was found near Milanville, Pennsylvania, and another specimen was found on a hillock near the Paupack Creek. Most of the examples from the Mason survey were from the middle and lower Delaware River valley, although two were found west of the reservoir near Pocono Lake in Monroe County, Pennsylvania.

During the summer of 1968 the Pennsylvania Historical and Museum Commission excavated a nearly complete mastodon from a bog near Marshalls Creek, Monroe County, Pennsylvania (Hoff 1969). The Commission kindly supplied the two unpublished radiocarbon dates which are: 10,210 B.C. ± 180 years (I-3929) and 10,070 B.C. ± 180 years (I-3930). Unfortunately, there were no artifacts associated with this skeleton. Over the past 150 years there have been 40 recorded discoveries of mastodon remains for New Jersey, eight of which were located in Sussex and Warren counties. In 1954, a mastodon was found at Highland Lake near Vernon in Sussex County, and peat associated with these remains is radiocarbon dated to 8,840 B.C. ± 200 years (Jepsen 1964: 10, 16).

It should be noted that it is extremely unlikely that the diet of the Paleo-Indian was restricted to proboscideans. These are conspicuous remains and because of their size they tend to be preserved while bones of smaller animals have long since vanished. In the Northeast it is becoming increasingly clear that Early Man hunted caribou (Byers 1966: 43; Funk and others 1969), but this by no means was his only source of meat. The Paleo-Indian probably ate everything that he could kill, catch, or collect.

With the exception of one specimen and a small assemblage of flake tools from the Zierdt site, fluted points from the Upper Delaware Valley are random surface finds. Mostly they resemble the eastern Clovis type, and are made of fine-grained flints and jaspers. In the Macpherson Collection several of the jasper scrapers and knives are unifacially worked and may possibly represent Paleo-Indian tools. The presence of at least 10 or 11 possible fluted points from the Tocks Island Reservoir, the relatively high frequency of mastodon remains (although none has been associated with man-made tools) from the surrounding area, and a comparable high frequency of fluted points in those areas demonstrate that Early Man hunted and foraged in the Upper Delaware Valley.

Fluted points occur with a greater frequency in areas to the south, and on the basis of present information it appears that the Delaware Valley was first occupied by Paleo-Indian hunters moving up the valley (Mason 1959: 15). There is a probable diminution in the duration of this period as latitude increases. However, it is not likely that all movement was south to north, but rather it was generally a northerly drift, while from time to time these hunters roamed in a southerly direction and exploited the resources of minor tributary streams as well. This shifting pattern of free wandering helps to account for the wide distribution of certain distinctive flints and jaspers. Pennsylvania jaspers are found in New York, Massachusetts, and New Jersey, while New York materials are found in Pennsylvania, New Jersey, and elsewhere.

It would appear that this occupation of the Upper Delaware Valley is at least as old and probably older than the Paleo-Indian occupation of the Debert site in Nova Scotia where 13 radiocarbon dates average 8,635 B.C. ± 47 years (Byers 1966: 42). It is likely that the period of the Paleo-Indian in the Upper Delaware corresponds to the age of the caribou bones from Dutchess Quarry Cave, and these early inhabitants of the cave may have roamed through part of the Delaware Valley in search of food. These local events are a part of the cultural events having a continental distribution which transpired during the Two Creeks Interstadial and the Valders substage of late Wisconsin times as the coniferous forest replaced the earlier taiga or tundra-like species. It seems reasonable to expect Early May to date from 11,000 B.C. to 9,000 B.C. in this area.

EARLY ARCHAIC

Present evidence indicates that the time between the Paleo-Indian occupation and the firmly established Late Archaic occupations is a period of very light population density. As yet there are no unfluted lanceolate points produced by parallel flaking resembling Plainview, Angostura, Scottsbluff, Eden, and other similar western projectile types known for the area. (South and east of the reservoir area in Great Meadows, New Jersey, a single plano-like point is reported to have been found by F. Dayton Staats.) No corner- or side-notched specimens resembling the distinctive Palmer, Kirk, and Stanly types, which range in age from about 6500 B.C. to 5000 B.C. in deep stratified sites in the Carolina Piedmont, are present (Coe 1964: 121). At the St. Albans site in the Kanawha River valley in West Virginia, Kirk Corner-Notched points are even earlier and they date from 7900 B.C. to 6900 B.C. (Broyles 1966: 19-21, 40). Geographically closer to the Delaware Valley, at the Sheep Rock Shelter in central Pennsylvania, two rather crude side-notched points identified as Kirk Corner-Notched were found in Level 9, which is radiocarbon dated to 5100 B.C. ± 250 years (Michels and Smith 1967: 571-2, 683, 863).

Some of the rude side-notched types from the Macpherson Collection (Fig. 121 D) which are included in the category of generalized side-notched may be similar to the two examples from the Sheep Rock site, in Pennsylvania. Still other specimens in the generalized side-notched and Otter Creek (Fig. 115 F) groups appear to resemble the three Otter Creek-like points found near a hearth in the deeper levels of the Sylvan Lake site, radiocarbon dated to 4610 B.C. ± 100 years (Funk 1965: 153), and appear to resemble the two examples from the Dutchess Quarry Cave (Funk and others 1969). However, these projectile points are not crisp forms, and stratigraphic evidence is lacking for the cultural position of these rude side-notched types in the Upper Delaware Valley.

On a typological basis the bifurcate-stemmed points (Fig. 121 C) resembling the LeCroy and St. Albans points which are radiocarbon dated to 6300 B.C. ± 100 years at the St. Albans site (Broyles 1966: 26-7) are possible representatives of the Early Archaic. The evidence is slight and largely speculative. Except for a single specimen excavated from a level beneath the Laurentian component at the Zierdt site, bifurcate-stemmed points are surface finds. This projectile point style has a very widespread distribution, with more than one type group present during the long time span in which this form appears to have endured (Fitting 1964). Since bifurcate-stemmed points are found as a minority Archaic form at numerous sites in the Northeast, there is at present no local stratigraphic evidence to confidently assign this type to the Early Archaic, although it is tentatively placed in this period. Other Early Archaic complexes may be present but they await discovery and identification.

Ritchie (1965a: 32-3) has commented on the paucity of evidence for the Early Archaic in New York and the absence of an unspecialized lithic complex such as the DeTurk industry postulated by Witthoft (1959b: 83-4) and the Kelly phase of Maine suggested by Byers (1959: 240). No material of this nature is recognized for the Upper Delaware Valley. Leslie (1963b; 1964a) has also been unable to identify a local Early Archaic, and he has discussed some of the attendant problems in dealing with this period.

Although the data are of a negative character, we would postulate that the Upper Delaware Valley supported an extremely sparse population during the Early Archaic, and it may have been of about the same size as the population of the preceding Paleo-Indian period. This Early Archaic occupation would have likely extended from about 8000 B.C. to 4000 B.C., during which time the environment changed from taiga-tundra conditions to a boreal spruce-pine forest and finally to a mixed deciduous broadleaf environment resembling present-day conditions. A plausible explanation for the low population density is that boreal forests provide a poor supply of plant foods, and consequently there is little for animals to feed upon. As a result, only a few species of game animals are available to the hunter. Fitting (1968) has commented on this period of postglacial readaptation, during which time three environmental zones existed in eastern United States. He argues convincingly that man made only modest use of one of these zones, the boreal forest, because of its low carrying capacity.

LATE ARCHAIC (FIGS. 103, 104)

Data for the Late Archaic complexes of the pre-broadspear era derive from excavations at several sites, site survey, and typological and quantitative analysis of the Macpherson Collection (Table 13). This evidence is supported by two radiocardon assays. There is a large number of relatively shallow sites with mixed Late Archaic components, such as Egypt Mills, Miller Field, Zimmermann, Zierdt, Herring No. 1, and others. Deeply stratified sites are rare, and to date only the Faucett and Brodhead-Heller sites meet this condition. Unfortunately the former yielded only three single projectile point types in the pre-Perkiomen levels and a few non-diagnostic materials. At the Brodhead-Heller site, a limited Late Archaic assemblage underlies a Perkiomen component in a profile that is differentiated by occupational activities as well as by natural conditions.

The major problem in dealing with the ubiquitous remains of the Late Archaic is that of determining the content of each component at individual sites. There is a dearth of features associated with Archaic manifestations, and because of the lack of proper context and the shallowness of the culture-bearing strata at most sites, it is usually difficult and sometimes impossible to determine with assurance whether the assemblage was produced by a single component or whether it represents multicomponent manifestations. Organic remains are almost never present, so that subsistence must be inferred.

My bias in approaching problems of the Late Archaic is that most archeological assemblages discussed in the literature are the product of multicomponent mixing. No deep site in the Northeast has been discovered which presents as clear a picture of single prehistoric hunting and gathering groups as do Coe's (1964) sites on the North Carolina Piedmont or Broyles' (1966) St. Albans site along the Kanawha River in West Virginia. If a rich and deeply stratified site

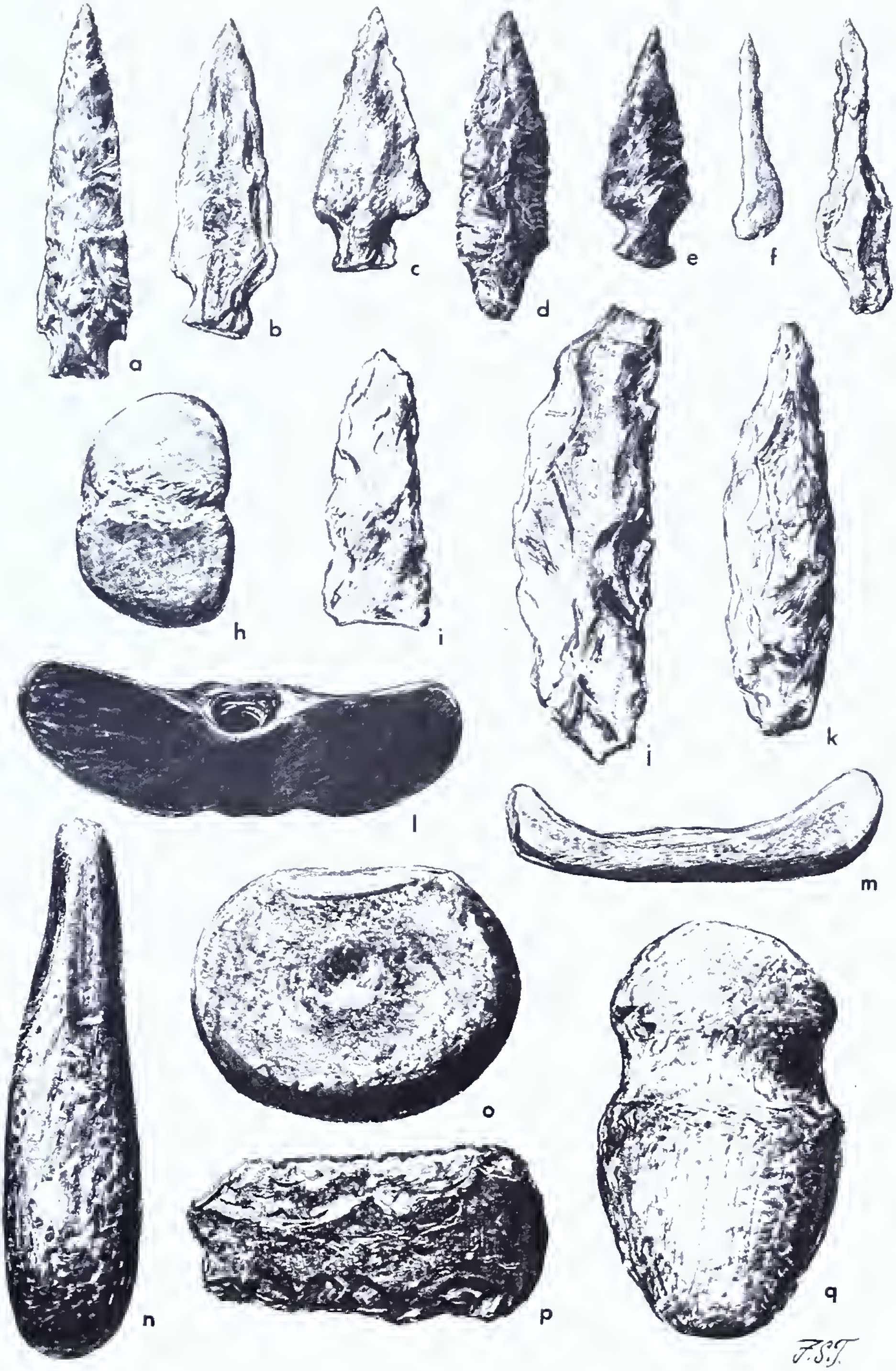


Fig. 103. TYPICAL ARTIFACTS OF THE DELAWARE VALLEY ARCHAIC complex: a, Lackawaxen Straight Stem point; b, Lackawaxen Expanded Stem point; c, Egypt Mills point; d, Lackawaxen Converging Stem point; e, Macpherson point; f, g, drills; h, grooved netsinker; i, trianguloid knife; j, k, large ovate knives; l, bipennate spear thrower weight; m, abrading stone; n, pestle; o, pitted muller; p, adze; q, grooved axe.

were to be excavated, it is very likely that it would demonstrate the essential projectile point and stone tool uniformity within a single component. The Sheep Rock Shelter (Michels and Smith 1967) provides some evidence, but the cultural remains in the deeper levels are very sparse. Diversity is a luxury unknown to the Archaic band. Greater diversity and complexity is not achieved until agriculture is firmly established.

Most of the sites in the Northeast were visited many times over the millenniums by a large number of small, diverse local bands with varying traditions of stone technology. The debris left behind by a specific group may be as undiagnostic as a hammerstone and a utilized spall, while in other instances a single diagnostic projectile point may be the only remaining trace of a group of 40 individuals. The trampling of these remains and the absence of any appreciable soil build-up serves to mix the assemblages and to leave them exposed to the vagaries of animals, natural forces, and people.

The Friedman II site, located in New Jersey near the Dingmans Ferry bridge, was dug in 1965 by the New Jersey State Museum (Marchiando 1967a). It is an example of the confusing Archaic assemblages that are present throughout the area. A report has not been published nor has the data been analyzed in detail, but Marchiando kindly permitted us to examine the rather extensive projectile point series from this site and made available Toth's soil analysis. His report follows:

> The 0- to 10-inch depth probably represents a flooding with material consisting of rather coarse stones and fine materials. Below the 10-inch depth and up to 47 inches is a uniform layer of materials with very little change in mechanical composition. However, apparently the depth marked 10 to 18-inches represents the older A_0 horizon which was covered by the rather stony material.

The site was excavated by six-inch levels and the preliminary findings of the cultural remains in those levels is discussed below.

The various manifestations obviously are mixed, but some instructive information can be derived from a limited examination of this collection. Only the contents of the lower three levels are reported herein since samples from Levels 1 and 2 are not relevant to this problem. Levels 3, 4, and 5 are dominated by projectile points of the Delaware Valley Archaic complex. Level 5, the deepest level, contains Lackawaxen Expanded Stem (5), Straight Stem (4), and Converging Stem (2) subtypes. Also conspicuous are Vosburg (4), Beekman Triangle (7), as well as the Brewerton types (Eared, and Eared-Notched), Macpherson, Shriver Expanded Stem, bifurcate stemmed, and Normanskill in small numbers. Two broadspear basal fragments, which may be the Lehigh/Koens-Crispin type, are present. Level 4 held similar types with the Lackawaxen Straight Stem subtype, represented by 17 examples, the most abundant. There are 16 specimens of the Expanded Stem subtype, 10 examples of the Converging Stem subtype, and Beekman Triangles are well represented (16). Other types are Vosburg (6), Brewerton types [Side-Notched (6), Corner-Notched (5), and Eared-Notched (2)], Lamoka-like, and Normanskill-like. There are four broadspears but only one is a good example. Eleven Orient fishtail points are present in this stratum. Level 3 contains further evidence for the presence of the Delaware Valley Archaic complex with the Lackawaxen Expanded Stem (14) dominant, while the Straight Stem subtype (12) and Converging Stem subtype (2) also are found. Beekman Triangles (6), Vosburg (2), Brewerton Side-Notched, Brewerton Eared, Eshback, Perkiomen, Lehigh, Orient, and other point types are present.

Rather limited information can be deduced from this preliminary typological analysis. The presence of Beekman Triangles with Vosburg points is interesting since this situation occurs at sites in the upper Hudson Valley (Funk 1965: 151), and Brennan (November 24, 1969: personal correspondence) reports that Beekman Triangles are contemporary with his Taconic tradition at Montrose Point in the lower Hudson Valley. The association of Vosburg and Beekman Triangles with Lackawaxen Stemmed, various Brewerton types, and other minor projectile point types is not regarded as the product of a single component nor do these belong to the same tradition. The site is not stratified and it contains an unknown number of components. Because of the strong preference for local shale and argillaceous shale, it is obvious that these projectiles are of local manufacture. It is likely that Vosburg and Brewerton groups were in the area long enough to establish themselves as participants in a shale- or argillaceous shale-using industry, a trait they shared with the distinctly different groups of the Lackawaxen tradition.

The basic local Late Archaic manifestation is the newly postulated Delaware Valley Archaic complex (Fig. 103), whose major diagnostic traits are a distinctive lithic industry as expressed by the Lackawaxen Stemmed points (Fig. 116 A-C). The latter is a long narrow-bladed, narrow-stemmed form with either a straight, tapered, or expanded stem. These projectiles are usually fashioned from locally available shale or argillaceous shale. In terms of overall frequency, the Macpherson Collection indicates that the three subtypes of the Lackawaxen Stemmed point occur as frequently (11.80 per cent) as do all six projectile types of the Brewerton-Laurentian series (11.80 per cent). (Note: All frequency percentages and numbers of site locations are derived from the Macpherson Collection unless otherwise noted. Refer to Table 13.)

The primary foundation for the establishment of the Delaware Valley Archaic complex is the excavated components at Brodhead-Heller, Faucett, and Egypt Mills sites, with supportive data derived from Zimmermann, Herring No. 1, Miller Field, Friedman II, and other sites. Brodhead-Heller, Level IV, tan sand Zone B, yielded evidence for the Delaware Valley Archaic complex including Lackawaxen Expanded Stem subtype (7), Macpherson (3), Egypt Mills (2), Brewerton Eared-Notched (1) types, and a stemmed straight-based projectile point. Other traits are adzes (blanks), chipped celts, chipped pebble, chopper, knives based upon utilized spalls, winged spearthrower weight, bipitted mullers, and a relatively low yield of argillite and argillaceous shale spalls together with a lesser quantity of spalls of flints, jasper, etc. Features are small rock-lined fireplaces. The Brewerton Eared-Notched specimen is not considered to be an intrinsic expression of this complex.

Items of the Delaware Valley Archaic complex found at the Egypt Mills site include: Lackawaxen Stemmed [Straight Stem (5) and Converging Stem (9) subtypes]; Egypt Mills (8); Lamoka-like (7) projectile points; knives (ovate, trianguloid, crescent-shaped); drills; pestles; celts; mullers; hammerstones; milling stones; spearthrower weight; abraded stones; pitted stones; and possibly netsinkers. It is likely that some of these less diagnostic traits belong to other components at Egypt Mills. Because of the conservative nature and the almost universal use of these artifacts, they are regarded as traits of the Delaware Valley Archaic complex.

Based upon information obtained from the excavations of a subsurface component at the Herring No. 1 site, Werner (1968) observed nearly similar traits for the Delaware Valley Archaic complex. He reports:

> This assemblage includes: Lackawaxen Stemmed points; thin, tabular blanks; milling stones; mullers; shale crescents; netsinkers; bi-pinnate and tie-on spearthrower weights; choppers; crude celts; three-quarter grooved axe; and a long, bifacially flaked spear or knife. A portion of the site includes

> as minority point types corner-notched, corner-removed, and Eshback points. The Lackawaxen point is almost entirely made of argillite and argillaceous shale. Helderberg flint is the minority material. The assemblage is surprisingly similar to that of the Bare Island complex at the Kent Halley site in the lower Susquehanna Valley. (Kinsey 1959: 129-31)

Although the semilunar slate knife or ulu (Fig. 104 n, o) is known for the area (Leslie 1966), and these as well as other ground slate objects occur in the Macpherson Collection, they are rare. Doubtlessly their occurrence is the result of Laurentian influence. Grooved axes and gouges are also rarities, and Laurentian-type copper implements have not been reported.

The Delaware Valley Archaic complex is viewed as a regional Late Archaic manifestation contemporary with Brewerton but enduring over a longer span of time. The complex belongs to a larger tradition which follows the Piedmont and includes the coastal waters and tidewater areas extending from Georgia to New England. Stephenson (1963: 200-5) has referred to the largest portion of this area as the Middle Atlantic Seaboard Culture Province, although he neglects to include the Upper Delaware Valley. Others have recognized the essential unity of a projectile point tradition distinct from the Brewerton-Laurentian series and have variously named this tradition. Byers (1959: 236-43) has used the term Coastal, Brennan (1967: 5) suggested the term Taconic tradition, while Funk proposed Appalachian tradition (Ritchie 1969a: 144). Here I offer the term Piedmont tradition as more inclusive, with the understanding that manifestations of similar character which are located on the coastal plain are to be included. Projectile point types of this tradition are a distinct contrast to the Brewerton-Laurentian types. Instead of being broad and short with side or corner notches, or eared, Piedmont points have long narrow blades and generally weak shoulders. Stems are narrow although some are expanded, some are converging, and others are roughly side- or corner-notched. Named projectile point types of this tradition include: Morrow Mountain I and II, Bare Island, Poplar Island, Lackawaxen Stemmed, Wading River, Squibnocket Stemmed, Sylvan Lake Side-Notched, Macpherson, and Normanskill. Less distinct forms have been referred to as Normanskill-like and Lamoka-like. Lamoka is probably a member of this tradition. A minority and variant projectile point type of the Delaware Valley Archaic complex is the Egypt Mills point (.50 per cent). This is a stemmed, medium-size point with a fairly broad blade and an expanded base (Fig. 116 D). It appears

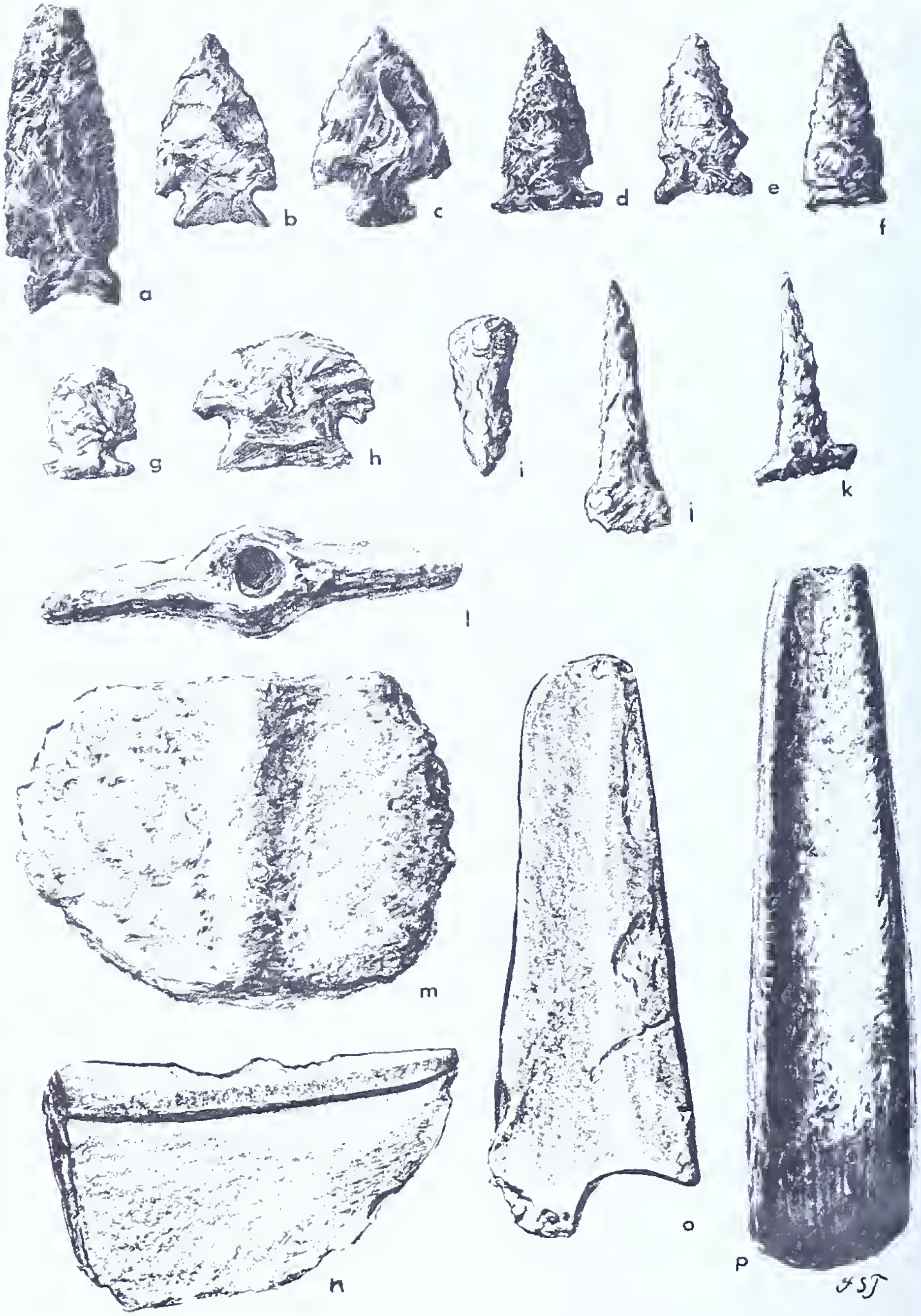


Fig 104. TYPICAL LAURENTIAN ARTIFACTS: a, Otter Creek point; b, Vosburg point; c, Brewerton Corner-notched point; d, Brewerton Side-notched point; e, Brewerton Eared-notched point; f, Brewerton Eared-Triangular point; g, Brewerton Side-notched scraper; h, Brewerton Corner-notched scraper; i, scraper; j, drill; k, "T"-shaped drill; l, m, oval spear thrower weights; n, o, ground slate knives; p, gouge.

to be either a late and broad variant of the Lackawaxen Stemmed point or an early local expression of the Lehigh/Koens-Crispin point in shale. Another minority type for the area is the Eshback point. It is a moderately broad, basally notched, isosceles triangular type which occurs with a .70 per cent frequency. The Eshback point is more closely related to types of the Brewerton series and Vosburg.

Among the various complexes of the Piedmont tradition, there is a significant cultural preference for the use of locally available material for projectile points and other chipped stone tools. Shale, argillaceous shale, argillite, rhyolite, quartz, and quartzite are commonly used in specific localities. A negative preference is expressed for fine-grained flints, cherts, and jaspers.

Two radiocarbon dates provide a range for the Delaware Valley Archaic complex. At the Faucett site a single Brewerton Eared-Notched specimen was located in a deep stratified context at 79 inches below datum, which is considerably deeper than subsequent components. Also found in this level were a bipitted muller and a few pieces of argillaceous shale, which might be weathered knife forms. Charcoal collected at this level provided a radiocarbon date of 3230 B.C. ± 200 years. Level IV of the Broadhead-Heller site contained the Lackawaxen expression of the Delaware Valley Archaic complex and this level was immediately below the Perkiomen component. Charcoal from a small rock-lined hearth yielded a radiocarbon date of 1710 B.C. ± 120 years. The range for this complex appears to be a span of time extending from at least 3200 B.C. and perhaps greater to 1700 B.C.

This chronology cannot stand without a word of caution. It is conjectured that the deepest level at the Faucett site does not represent a Brewerton component, but that greater horizontal exploration would have revealed traits diagnostic of the Lackawaxen phase. Lithic materials found in that level provide an indication of the persistance of the local shale- or argillaceous shale-using industry. A Brewerton Eared-Notched point is from Level IV at Brodhead-Heller, and it is believed to be a cross-cultural link between Brewerton and the Delaware Valley Archaic complex. If the associations and the radiocarbon dates at Faucett and Brodhead-Heller are correct (there is no obvious reason to doubt the validity of the dates or the associations), then this Brewerton projectile form occupies a long time span. This is a longer time than might have been anticipated for a projectile point type to endure. During an earlier time when change came slowly, point types may last longer; however, during the Late Archaic where change is more rapid, we might expect a shorter period of duration for a type.

Surface collections provide an excellent basis for observing the distribution, frequency, and occurrence of projectile point types as well as other artifacts. These collections, however, are of limited assistance in establishing a chronological framework when sufficient stratigraphic evidence is wanting. Too often there is little relationship between surface-collected archeological materials and the excavated material. Although discrete components have not been isolated, stratigraphic, distributional, and typological evidence indicates that Brewerton and Vosburg complexes were a factor in the cultural events that transpired during the Late Archaic in the Upper Delaware Valley. This projectile point tradition shows its greatest authority west of the Appalachian Mountains extending from the Ohio Valley through central New York to southern New England.

The Brewerton-Laurentian projectile points, the gouge, the ulu, and ground slate objects may have diffused through intermittent contact resulting from the movement of migratory bands of hunting parties whose territory included southern New York, northern New Jersey, and Pennsylvania (Fig. 104). These diagnostic projectile points are not usually found as pure components. Instead they are found in a mixed Archaic context at shallow sites and often they are links between the Hudson Valley and the local non-Laurentian complexes.

The Brewerton complex is represented by four Brewerton types (Fig. 115 B-E): Brewerton Side-Notched (2.90 per cent), Brewerton Corner-Notched (2.40 per cent), Brewerton Eared-Triangular (1.30 per cent), and Brewerton Eared-Notched (.50 per cent) (Table 13). A time span for this complex in central New York may extend from about 3000 B.C. to 1700 B.C. and it is thought to reach its climax about 2000 B.C. (Ritchie 1965a: 91). In central Pennsylvania at the Sheep Rock shelter, Stratum 5 containing a Brewerton Side-Notched point yielded a radiocarbon date of 2350 B.C. ± 180 years (Michels and Smith 1967: 578, 863).

Vosburg (Fig. 115 A) is represented by the diagnostic projectile point of that name and is rather strong (4.3 per cent, 84 specimens), which is not unexpected since its center is close by in the Hudson Valley. Thirty to forty sites are likely to be represented by these examples. On the basis of stratigraphic evidence and two radiocarbon dates, Funk (1965: 156) suggests 3200 B.C. to 2500 B.C. as a span of time.

Otter Creek points (Fig. 115 F), Vergennes complex, are not common (.50 per cent), with 8 to 10 sites represented. At Sylvan Lake, Otter

Creek-like points underlie Vosburg, and a hearth dated to 4610 B.C. ± 100 years provides an early date for this type (Funk 1965: 153), although at the Hornblower I site in Massachusetts a single Otter Creek point was found in a stratum with Brewerton types which is dated to 2270 B.C. ± 160 years (Ritchie 1965b: 136).

Lamoka points (Fig. 117 D) are rather lightly represented in the Upper Delaware and they decrease in the southern portion of the area. The presence of these types is somewhat heavier between Milford and Point Mountain (Leslie 1963b). Eighteen specimens (.90 per cent) are recorded as the true Lamoka type with about nine sites represented. The beveled adze, the other major diagnostic trait for Lamoka, is rare although Ritchie (1965a: 40) has noted three examples from the Milford area as has Leslie (1963b: 41).

Lacking a better term and following the lead of Funk (1965: 146-7) and Hayes (February 5, 1969: personal correspondence), I identify a fairly large group of projectile points as Lamoka-like points (Fig. 117 E). These show a rather high frequency (7.2 per cent or 142 specimens) and occur at 25 to 35 sites. To date, these forms have been found in the context of shallow multicomponent Archaic sites. At the Egypt Mills site, several points of this type occur in two arbitrary levels. In the lower level the distribution corresponds to the Egypt Mills point and the Lackawaxen Stemmed (Converging Stem subtype), except they do not occur in the deepest levels with the latter type. In the upper level, five Lamoka-like points occur with one Lackawaxen Stemmed point (Straight Stem subtype), three Normanskill-like points, and a single Brewerton Side-Notched point.

These Lamoka-like points resemble a similar group of specimens excavated from the middle and upper portions of Stratum 2 at the Sylvan Lake Rockshelter, which is radiocarbon dated to 2210 B.C. ± 140 years (Funk 1965: 146). Also at the Farrel Farm in western New York a Lamoka-like and a Normanskill-like collection resembles this group and is radiocarbon dated to 2030 B.C. ± 160 years and 1940 B.C. ± 120 years (Hayes February 5, 1969: personal correspondence). These rough, narrow-bladed, weakly-shouldered Lamoka-like points with wide side notches intergrade with the local Normanskill-like, Macpherson, and Lackawaxen Stemmed points (Figs. 116 A-C; 117). They are similar to points of the northern Piedmont tradition, but they require further study from the excavation of stratified sites before this problem can be clarified and their true context determined.

Normanskill points (1.50 per cent, 29) are slightly more common than Lamoka, and they are also somewhat more abundant in the northern portion of the reservoir. About 10 to 14 sites in the southern area are represented by this type (Fig. 117 B). At the Zierdt site a number of examples are found with Brewerton types, but at Egypt Mills the type is found below Orient but above Brewerton and the Delaware Valley Archaic complex. The earlier date 1930 B.C. ± 100 years for the Bent site in the Mohawk Valley, where Normanskill points are part of the River phase, is in line with the meager evidence for the chronological position of this type in the Upper Delaware. This date also corresponds to the Farrell Farm dates for the mixed assemblage of Lamoka-like and Normanskill-like points. Distinctions between these two catchall groups are not clearcut.

One of a number of unsolved problems is that of the unnamed component from Level IIb at the Brodhead-Heller site which apparently relates to Normanskill. A small rock-lined fireplace provided charcoal for a radiocarbon date of 1440 B.C. ± 100 years. Associated with this level were three broken but distinctly wide and deeply side-notched Normanskill-like points (Fig. 63 Y-AA) and possibly a number of argillite spalls. This was the only evidence for the component, which is stratigraphically situated between the Perkiomen and Orient levels. The date 1440 B.C. ± 100 years for the component is only 110 years earlier than a late date 1350 B.C. ± 200 years for a Normanskill component at the Bent site, which is considered by Ritchie (1965a: 126) to be too late for Normanskill. If we ascribe a validity to both dates, we can conjecture that the Normanskill phase peaked in the Mohawk Valley about 2000 B.C. to 1900 B.C. and that it extended into the Upper Delaware Valley about that time. It might have persisted until about 1400 B.C. to 1300 B.C. in both the Mohawk and the Delaware valleys, but the diagnostic projectile point underwent some modification and became less distinctive in the Delaware. Broadly speaking, there are roughly similar projectile point forms representing corresponding events in western New York and elsewhere.

In summary, during the Late Archaic, extending from about 3500 B.C. to 1700 B.C., the Upper Delaware Valley experienced a variety of cultural influences. The strongest expression is the Delaware Valley Archaic complex (Fig. 103), which is a participant in a tradition that includes Sylvan Lake in the upper Hudson Valley, Taconic in the lower Hudson, Wading River on Long Island, Squibnocket in Massachusetts, Bare Island and Poplar Island in the lower Susquehanna, Accokeek Creek on the Potomac, as well as many other identified and unidentified complexes having relatively long narrow-bladed and small-stemmed points as the characteristic type. The term Piedmont tradition is offered as a suitable term for this non-Laurentian tradition. The terminal date for the Delaware Valley Archaic complex is secure, but the beginning of the range, although based upon a radiocarbon date from a deep site, is in part hypothetical because of the paucity of associated materials with that level. Probably the complex reached its climax about 2400 B.C. to 2200 B.C.

During the same period, although perhaps for a shorter period of time, Laurentian influence was felt in the form of certain diagnostic projectile point types and the sporadic occurrence of gouges, ulus, and pieces of ground slate (Fig. 104). Prepared crematory basins, the use of red ochre, and copper tools are not locally reported in an Archaic context. Laurentian components were not well established in the Upper Delaware. The Vosburg phase, 3200 B.C. to 2500 B.C., is represented by the largest number of projectile points of this tradition. Brewerton influence and intrusion is felt in the form of diagnostic points as an index of cross-cultural contact. Brewerton-Laurentian influences are greatest in the Milford area and north.

Projectile points of other cultural expressions are Lamoka, Otter Creek, and Normanskill. Data extrapolated from the Hudson Valley would place the Otter Creek type of the Vergennes complex to at least 4600 B.C. The influence of the latter and Lamoka are light. Seven radiocarbon dates from the type site in central New York place Lamoka at 2500 B.C., while Normanskill extends from about 2000 B.C. to 1400 B.C. and is contemporary with the broadspear phases.

As an overview, I see the Upper Delaware Valley as a marginal area between two widespread Late Archaic traditions: Piedmont and Laurentian. The former is locally dominant and it is found on the Piedmont through the coastal plain of the Middle Atlantic Seaboard province. Laurentian is centered in the Lake Forest belt. The culture complexes representing these traditions are acculturated and blurred. A lack of deeply stratified sites with associated assemblages retards making definitive judgments on the nature of the discrete cultures that were surely present.

BROADSPEAR TRADITION (FIG. 105)

With the advances of archeological research in recent years, it is now possible to bring into sharper focus some details of what has been referred to herein as the broadspear tradition. In the Upper Delaware Valley this tradition is established and delineated by the isolation of significant representative components at Miller Field, Zimmermann,

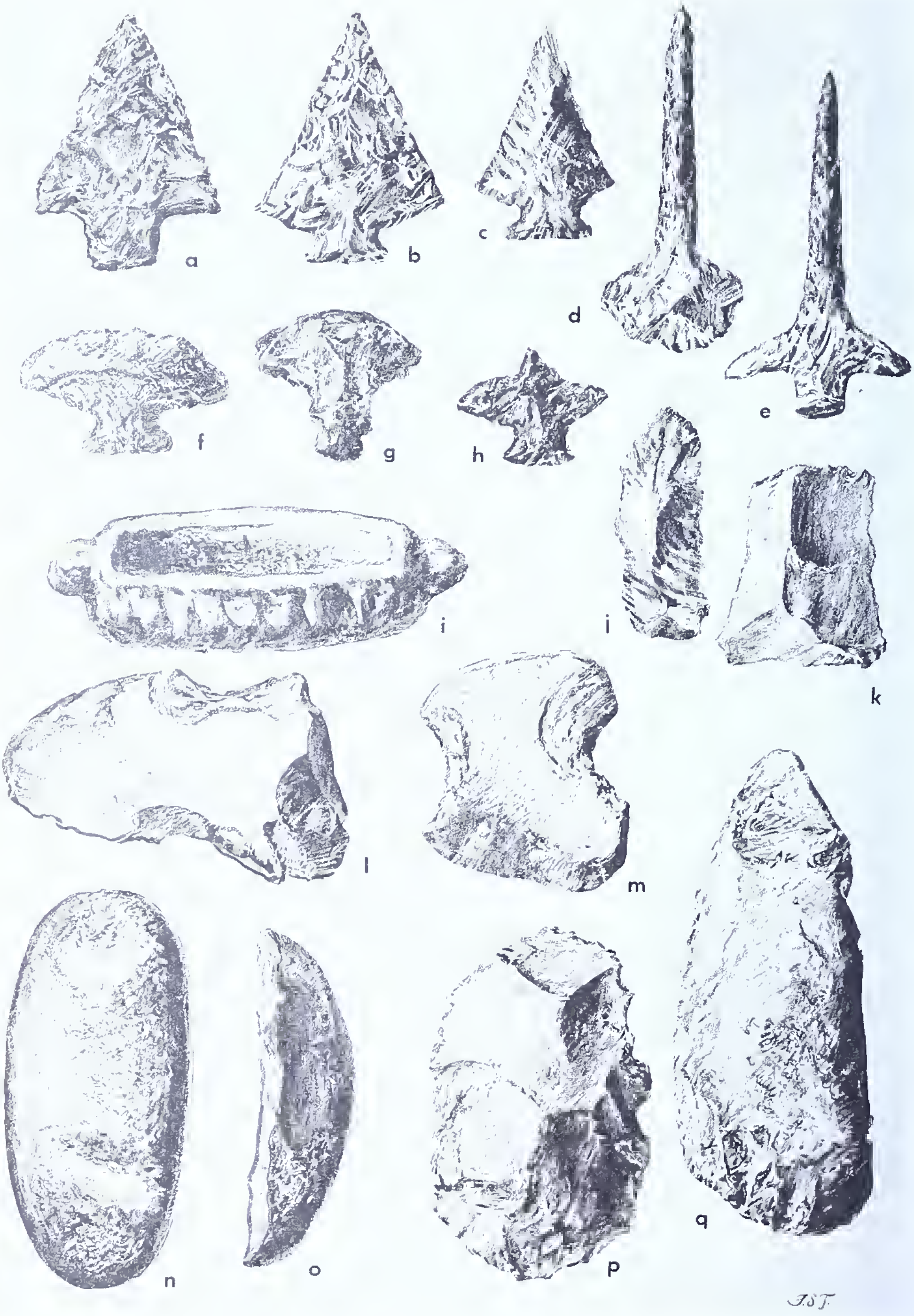


Fig. 105. TYPICAL ARTIFACTS OF THE BROADSPEAR TRADITION: a, Lehigh/Koens-Crispen broad spear; b, Perkiomen broad spear; c, Susquehanna broad spear; d, drill; e, cruciform drill made from a broad spear; f, g, scrapers made from broad spears; h, graver; i, soapstone vessel; j, k, worked jasper flakes; l, unfinished tie-on spear thrower weight (?); m, netsinker; n, o, abrading stones; p, oval chopper; q, adze blank.

Brodhead-Heller, and Faucett sites as well as minor components at other sites including Peters-Albrecht (36-Pi-22). The data is supported by stratigraphy and by five remarkably consistent radiocarbon dates. The postulated reconstruction of the broadspear tradition follows.

Broad projectile point forms (Fig. 118 A, B) make their appearance in the Northeast beginning about 2200 B.C. to 2000 B.C. These show a morphological similarity to the Savannah River Stemmed points of quartzite, rhyolite, or andesite, whose cultural position is documented at several stratified sites in the North Carolina Piedmont, and this is verified by a radiocarbon date of 1944 B.C. ± 250 years for the Gaston site (Coe 1964: 44-5, 118). A few small fragments of steatite vessels and two unfinished grooved axes are significant items associated with the Savannah River level at that site. For the Susquehanna and the Schuylkill drainage of eastern Pennsylvania, Witthoft (1959b: 81-3) recognizes as a type of broad, corner-removed point (sometimes referred to as the Long point), usually made of quartzite, which he attributes to an unidentified Early Archaic complex. Although Witthoft acknowledges typological similarities, he rejects a temporal relationship between these points and certain generally similar forms from New England (see Fowler 1968b: Fig. 11, who also refers to this form as Early Archaic) and the Savannah River Stemmed point. Witthoft views the rhyolite-using industry of the South Mountain region as antecedent to the Susquehanna broadspear. For my part I would agree with Ritchie (1965a: 152) that the quartzite Pennsylvania broad, corner-removed form as well as the other similar Late Archaic types influenced the development of the specialized broadspear types. The Genesee point of central New York may also be viewed as a prototype in the Late Archaic trend toward the emergence of the broadspear. At Frontenac Island the Genesee is considered to postdate 2500 B.C., and it may date as late as 2000 B.C. to 1700 B.C. (Ritchie 1965a: 107).

Witthoft (1953), in explanation of three broadspear cultures (phases), introduced the concept of the Transitional period, which he considered as a distinct epoch representing a sharp break with the preceding complexes during a time of marked cultural change. For Witthoft the relatively brief Transitional period falls between Late Archaic and Early Woodland. The term has received uneven acceptance largely because most archeologists consider it to be ambiguous since all cultures are in a state of transition. Nor has archeological investigation of the broadspear phases been pursued thoroughly until recently.

The lead of Witthoft (1953), Ritchie (1965a; 1969a), and Leslie (1965a) in recognizing a Transitional period has not been followed in the present publication, except by Kraft. Essentially, these authors feel that the various distinctive broadspear stone (talc, amphibole, steatite, soapstone) bowl-using "cultures" are produced by a new and distinctive change in the life style. Witthoft (1953: 14) views the change as dramatic, while Ritchie (1969a: 152) emphasizes continuity with the preceding Archaic complexes. He observes that Transitional habitation sites are located along the same large streams and lakes as are Archaic and Woodland sites. I take the latter position while questioning a Transitional period as such, although this is contrary to a previously held view (Kinsey 1968).

The introduction of stone bowls would be a very important innovation in any primitive society; but soapstone culture is an inappropriate term since it is doubtful if the many stone bowl-using archeological manifestations had sufficient ethnological unity to be regarded as a culture. Properly, stone bowls should not be used to define a culture any more than side-notched projectile points, and it is unlikely that there is a Susquehanna, Perkiomen, or Lehigh culture in an anthropological sense. Stone bowl making does, however, constitute an industry and as such it is an important diagnostic trait.

During the several broadspear phases a riverine efficiency was achieved through a settlement pattern and a material culture that contrasts somewhat with preceding archeological manifestations. The latter are found in nearly all types of physiographic situations and in varying micro-ecological environments, while few broadspear components are located on hilltops and along the smaller streams. An important feature of many broadspear sites is the large rock-filled or platform-type hearth. There is a specific lithic preference for each of the various projectile point forms, with jasper employed for Lehigh and Perkiomen and rhyolite for Susquehanna broadspears. Stone bowls, which have been considered the hallmark of the tradition, are rarely abundant. A high degree of uniformity exists between the broadspear phases, and the people seem to have been highly mobile, possibly because of the use of canoes. In archeological terms, the total manifestation is of short duration.

It may be conjectured that there was a shift in emphasis from hunting to fishing by the broadspear people. Broadspears are probably less efficient for hunting deer and other game than narrow-shouldered points, since greater force would be required to drive a wide-shouldered projectile into a deer; but it would easily penetrate the softer flesh of fish. The shoulders of the broader projectile act as a toggle, and the spear is less likely to pull out against a struggling fish, even one as large as a sturgeon. Spearing migratory fish would have been a fairly efficient means of securing food during the spring. The evidence is lacking, but elsewhere (page 203) it is speculated that the large rock-filled features may be drying hearths representing community involvement in some specialized food procuring activity such as fishing.

While these traits and others are noteworthy, they are deemed insufficient for the establishment of a separate and distinct culture period. Fundamentally the subsistence pattern is that of the Archaic. At present the broadspear manifestation is regarded by me as a single rapidly expanding tradition which differentiated into several related regional phases. These phases are not considered as expressions of a single Susquehanna tradition as Ritchie (1969a: 136) and Dincauze (1968: 26-7, 77-9, 89) refer to them. The objection to Dincauze's (1968: 76) interpretation is more a matter of terminology than substance. She links Snook Kill, Frost Island, Perkiomen, and Lehigh in a basic Susquehanna tradition, which is not supported by the observed data because the priority of the Susquehanna phase, and hence its parenthood of the tradition has not been demonstrated. Hunter (1970) views the several broadspear phases as a divergent stage and the fishtail phases as a convergent stage in a developmental continuum. This useful concept is worthy of consideration and greater elaboration.

Here the interpretation is favored that a single broadspear tradition is aligned along major river systems and tributaries east of the Appalachian Mountains. There is an eastern division in the Delaware Valley and a western division in the Susquehanna Valley. The least well-defined Koens-Crispin and Lehigh phases are found in the Delaware Valley, particularly in the lower and middle Delaware and in the Lehigh and Schuylkill valleys. These two phases are considered to be early in the sequence and a major source of influence. The Snook Kill phase of the Hudson Valley of eastern New York is regarded as a regional relative of the Lehigh and Koens-Crispin phases, although the date 1470 B.C. ± 100 years from the Snook Kill type site (Ritchie 1969a: 136) seems somewhat late. Perkiomen follows Lehigh and is strongest in the Upper Delaware. The Susquehanna phase enjoys its greatest occurrence in the Susquehanna Valley, with probably several centers including one along the Piedmont section of the Potomac River. Diagnostic points of the Susquehanna type are seldom found in tidewater or mountainous areas, but they occur along the river from the mouth of the Monocacy River. The type extends into central New York as the Frost Island phase, although this phase shows a mixture of Dry Brook and Susquehanna as well as Perkiomen points, and the date 1250 B.C. ± 100 years on the Frost Island site (Ritchie 1969a: 157) is more in line with the date for the Dry Brook component at the Zimmermann site. In eastern Massachusetts, in the Boston Basin, the Watertown phase is represented by Mansion Inn blades and Wayland Notched points which are Susquehanna-related broadspears (Dincauze 1968). Two radiocarbon dates believed to date this phase are 1520 B.C. ± 125 years for the Vincent site located along the Merrimack River and 1670 B.C. ± 110 years for a site near Litchfield, New Hampshire, in the same river system (Dincauze 1968: 76). As defined here, therefore, there is a single Late Archaic broadspear tradition with numerous related regional expressions or phases.

The presence of the Susquehanna-related Ashtabula point and Perkiomen points in the upper Ohio Valley indicates that the broadspear tradition is not restricted to areas east of the Appalachian Mountains. (Recently I have heard a report of the presence of Perkiomen-type points in the Shenandoah Valley in Virginia.) Although relatively rare in Ohio, these broadspears are sometimes found in northeastern Ohio and also they are occasionally found in western New York. For this reason it is likely that fully developed Susquehanna/Ashtabula and Perkiomen groups penetrated the upper Ohio drainage via such river valleys as the Mahoning and the Shenango.

A mortuary complex with cremation burials and the use of red ochre is an intrinsic part of the Watertown phase of eastern Massachusetts. On Long Island there are two cremation burials associated with a Snook Kill manifestation, and the Piffard site in central New York was found to contain a cremation burial with red ochre, and a cache of 50 to 60 ceremonially "killed" Perkiomen broadspears of Onondaga chert (Ritchie 1969a: 138, 153-4). Cremation is an established practice for the Orient components on Long Island.

Kraft mentions (page 36) the possibility of a mortuary complex at the Miller Field site, but the evidence is inconclusive. Currently this burial pattern has not been observed for the broadspear and Orient fishtail components on the Upper Delaware. Apparently as the broadspear tradition entered New York and New England via the Susquehanna and Delaware valleys, it met with older resident Archaic populations who practiced cremation. It would seem that the broadspear peoples adopted cremation and its ceremonial aspects as an appropriate means to honor and dispose of their dead.

But events were not this simple. Cremation burials are present in the middle Delaware Valley at the recently discovered Savich Farm site near Camden, New Jersey, in the Rancocas drainage. This remarkable site, under excavation by Richard Regensberg has yielded an extremely rich mortuary complex, with Koens-Crispin and Savannah River-like projectile points, red ochre, and an abundance of spear-thrower weights. The implications of this unusual complex of traits are being pondered.

Whether the broadspear tradition originates at a hearth in the southeast, or whether it is the result of nearly simultaneous multilinear evolutionary trends at several regional centers in response to some environmental change is unknown. A south to northward expansion of the tradition is the viewpoint favored here. The concept of the broadspear developed quickly, and it rapidly spread throughout an area of about 1,000 miles in length during a period of 300 to 400 years. In the Upper Delaware Valley, two radiocarbon dates confirm the beginning phase of this tradition. At the Miller Field site there is a date of 1720 B.C. ± 120 years for a mixed Perkiomen and Koens-Crispin component (Kraft 1970). A similar date of 1720 B.C. ± 100 years was obtained on charcoal from a hearth containing a basal fragment of a Lehigh point at the Peters-Albrecht (36-Pi-22) site (Kinsey 1968).

LEHIGH/KOENS-CRISPIN PHASE

Lehigh/Koens-Crispin is the earliest of the local broadspear phases, and it is contemporary with the termination of the Delaware Valley Archaic complex. The compound terminology is admittedly awkward, but it illustrates the dilemma regarding the similarity of form between Lehigh and Koens-Crispin points. With the inclusion of still another manifestation, Lehigh/Koens-Crispin/Snook Kill, the conglomerate term becomes even more clumsy, but it expresses my interpretation of a basic similarity between the three groups. Savannah River Stemmed could, with some justification, also be added.

All the above broadspear types have nearly identical attributes except for lithic preference. Generally, Lehigh points are made of Pennsylvania jasper, Koens-Crispin examples are fashioned from argillite, and Snook Kill from eastern New York flints. Locality and lithic material determine the type rather than form. Lehigh specimens are found principally in the Lehigh and the Upper Delaware valleys, while in eastern New York, particularly in the upper Hudson Valley, the

Table 10. Comparison of Broad Spear and Fishtail Traits.

Phase	Lehigh/ Koens-Crispin	Perkiomen	Susquehanna	Watertown	Dry Brook	Frost Island	Orient	Orient
Component	Miller Field Peters-Albrecht (36-Pi-22)	Miller Field Brodhead-Heller Faucett	Zimmermann	Eastern Massachusetts	Zimmermann	New York	Miller Field Brodhead-Heller Faucett	Long Island
Traits								
Chipped Stone								
Lehigh/Koens-Crispin								
Broad spears	X	X						
Perkiomen broad spears		X				X		
Susquehanna broad spears		X	X	X		X		
Dry Brook fishtails					X	X	X	
Orient fishtails							X	X
Blanks			X	X	X	X		
Scrapers								
Biface		X		?	X		X	
Reworked from points		X	X		X	X	X	
Utilized flakes		X	X	?	X	?	X	?
Knives		X	X	X	X	X	X	X
Drills		X	X	X	X	X	X	X
Drills reworked from points		X	X	X	X	X	X	X
Strike-a-lights		X	X	X	X	X	X	X
Rough & Ground Stone								
Choppers		X	X		X	X	X	
Netsinkers		X			X	X	X	
Anvil stones		X	X		X	X	X	X
Pestles				X				
Mullers		X		X	X	X	X	X

Table 10. Continued

Phase	Lehigh/ Koens-Crispin	Perkiomen	Susquehanna	Watertown	Dry Brook	Frost Island	Orient	Orient
Component	Miller Field Peters-Albrecht (36-Pi-22)	Miller Field Brodhead-Heller Faucett	Zimmermann	Eastern Massachusetts	Zimmermann	New York	Miller Field Brodhead-Heller Faucett	Long Island
Traits								
Hammerstones		X	X	X	X	X	X	X
Adzes		X		X	X	X	X	X
Celts		X			X	X	X	X
Spearthrower weights		X			X		X	X
Grooved axes				X				X
Abrading stones		X	X	X	X		X	
Sinew stones						X		
Steatite								
Bowls		X		X	X	X	X	X
Cups, ladles, or spoons					X		X	
Gorgets					X	X		
Pendants or beads					X		X	
Pottery								
Cord-marked						X	X	X
Steatite-tempered							X	
Limonite or hematite				X	X			X
Features								
Large hearths		X			X		X	
Small or medium-sized hearths	X	X	X	?	X	X	X	X
Cremation burials				X		?	?	X
Killed artifacts		?		X		X	?	X

Lehigh intergrades with the Snook Kill type (Ritchie 1961: 47-8; 1965a: 134-41). South-central New Jersey is the center for the argillite Koens-Crispin point.

The previously mentioned date of 1720 B.C. ± 100 years for a small hearth at the Peters-Albrecht (22) site dates the Lehigh point, but no related assemblage is present. Nor has any pure Lehigh component been excavated elsewhere, but this distinctive point occurs as a minority type in Perkiomen components at Faucett, Brodhead-Heller, Friedman II, and Miller Field sites.

The Miller Field site provides the best data on a Koens-Crispin component, and it is the only site in the area where a significant number of specimens of this point type have been unearthed. At the Miller Field site a mixture of five Perkiomen points and a single Koens-Crispin type was found in a pit, with charcoal radiocarbon dated to 1720 B.C. ± 120 years. The component is believed by Kraft to be late Koens-Crispin and early Perkiomen. Unfortunately, it is not entirely clear as to exactly what belongs to this component in the Upper Delaware. Negative traits provide some clues to the character and content of the Lehigh and Koens-Crispin phases. Stone bowls apparently did not make an appearance during the beginning of the phases or, if present, they were exceedingly rare. Spearthrower weights have not been recognized, and food preparation tools are absent. This situation is identical with that reported for the Snook Kill component of the Weir site in eastern New York (Ritchie 1965a: 136). At that site choppers, broadspears utilized as knives, broad end scrapers, and a strike-a-light were found to be part of the component. A stone bowl fragment was found at the site. In contrast to the large rock-filled hearths known for the slightly later Perkiomen phase, Lehigh/Koens-Crispin hearths are small. Because of the predilection for jasper in the production of chipped stone tools, the Lehigh broadspear represents a greater departure from the preceding expressions of the Late Archaic. Koens-Crispin, on the other hand, shows greater continuity with these Late Archaic components as indicated by participation in an argillite-using industry. For these reasons, and also because of its south-central New Jersey orientation, Koens-Crispin is assigned a slight age priority.

PERKIOMEN PHASE

Perkiomen evolved locally from Lehigh. The association of five Lehigh points with the Perkiomen component at the Brodhead-Heller site, 1620 B.C. ± 100 years, and one Koens-Crispin point at the Miller Field site, 1720 B.C. ± 120 years, is interpreted as interaction between the two groups during the earlier phase. A second Perkiomen date from the Miller Field site of 1640 B.C. ± 100 years may either express a time range for the Perkiomen component or it may represent a subsequent Perkiomen occupation at that site. A later Perkiomen component, 1500 B.C. ± 120 years, at the Faucett site is almost pure Perkiomen since it contains only one Lehigh-type specimen.

Based upon information gleaned from several sites, artifact traits are fairly numerous for this phase. The distinctive Perkiomen broadspear of jasper is dominant, with Lehigh, Koens-Crispin, and Susquehanna types often present as minority types or as cross-cultural traits. Other chipped stone tools include crescent-shaped scrapers fashioned from broken spearpoints; drills made from spearpoints (both cruciform and expanded base forms are present) ; chipped, polished heavy adzes; possibly adze blank caches; bipennate spearthrower weights, and possibly notched and tie-on weights; rough cutting and chopping tools; abrading stones; utilized spalls; grinding stones; pitted mullers; and heavy notched netsinkers (apparently a late trait) . Soapstone bowls are present but they are not common. There is a strong propensity toward the utilization of Pennsylvania jasper in the production of chipped stone tools, and an abundance of large jasper spalls found on sites serve as markers for Perkiomen components. Rock-filled hearths or platforms are large and measure as much as 30 feet by 20 feet; they are thought to be community food-drying features. Perkiomen sites, as well as other sites of the broadspear tradition, are restricted to the flood plain.

Susquehanna Phase

The Susquehanna phase is the western division of the broadspear tradition, and it enjoys a greater geographic distribution than the other phases. Its antecedents are poorly defined Late Archaic components of southeastern Pennsylvania having Long and Savannah River Stemmed-like points as majority types. Later influence is derived from the Lehigh broadspear.

Susquehanna broadspears are rare in the Delaware Valley below Milford and less so above Milford. The Macpherson Collection, which represents the area between Dingmans Ferry and the Delaware Water Gap, contains a single example of this type, while Leslie (1965a: 57) notes the presence of these points in rhyolite above Milford. The occurrence of one Susquehanna type in the Macpherson Collection contrasts with 40 Perkiomen, 28 Lehigh, and 13 Savannah River Stemmed-like specimens from the same collection. Susquehanna broadspears have been reported for the Perkiomen components at the Brodhead-Heller site (two examples); at the Faucett site a rhyolite specimen which was reworked into a drill was probably associated with that component, while an example made of chalcedony is from the Miller Field site. Except for the Zimmermann site, Susquehanna broadspears are uncommon in the area. Susquehanna influence was exerted from the Susquehanna Valley, and very probably it entered the Upper Delaware via the North Branch and/or Lackawaxen River valleys.

The Zimmermann site is the only Delaware Valley site presently excavated that has a Susquehanna component, and it is radiocarbon dated to 1650 B.C. ± 80 years. Major traits reported by Werner (page 69) are Susquehanna broadspears predominantly made of rhyolite, with a few examples in chert, flint, and argillite; broadspear blanks; drills reworked from projectile points; knives; utilized flakes; thick oval siltstone cutting and chopping implements fashioned by percussion; anvils; a hammerstone; and a scarified pebble. Hearths range in size from 14 inches to 46 inches in diameter. Stone bowls are absent. The relatively shallow profile at this site presents a problem in separating a component of the Delaware Valley Archaic complex from the Susquehanna component. Some of the less diagnostic materials are probably traits of both.

In summary the specialized broadspear tradition develops as a result of a widespread Late Archaic (ca. 2200 B.C. to 2000 B.C.) trend toward broad blade projectile points. Savannah River Stemmed, Genesee, certain untyped corner-removed types, Long from Pennsylvania, and others from Massachusetts are examples of the earliest broadspear forms. Because of continuity with the preceding Late Archaic, the emerging broadspear tradition is possibly a response to environmental conditions rather than the movement of a new population into the eastern United States. The stimulus for this tradition emanates from the southeastern Piedmont, and it is noted that nearly all the sites are located on the flood plains of the major river valleys. An economic emphasis on fishing, especially of migratory fish, is postulated. Food gathering and food preparation were communal activities.

The immediate major influences for the broadspear tradition in the Upper Delaware are derived from south-central New Jersey and the Lehigh drainage of eastern Pennsylvania. Koens-Crispin emerges from the former area, but its influence in the Upper Delaware is modest. Lehigh is more prevalent although no pure component has been excavated. In eastern New York this phase is recognized as Snook Kill.

The Lehigh/Koens-Crispin phases are established by 1700 B.C. and the former provides the inspiration for Perkiomen, which is the most common broadspear phase in the Upper Delaware Valley. It endured for about 200 years from 1700 B.C. to 1500 B.C. The Susquehanna phase co-exists temporally with Perkiomen and it dates about 1650 B.C. The Frost Island phase in central New York and the Watertown phase in eastern Massachusetts are Susquehanna/Dry Brook-related manifestations in those areas. Perkiomen and Susquehanna phases are spatially separate. Susquehanna is pervasive in the Susquehanna Valley, with some spillover in the Milford area, while the situation is reversed for Perkiomen. Table 10 compares some of the broadspear and fishtail traits at various sites.

LATE ARCHAIC TO EARLY WOODLAND—FISHTAIL TRADITION (FIG. 106)

The fishtail tradition is defined by excavated components from stratigraphic sequences at Zimmermann, Brodhead-Heller, Miller Field, and the Faucett sites and another excavated component at Peters-Albrecht (21). The stratigraphic position of the fishtail components is located between the earlier broadspear components and later Woodland manifestations. This physical data is verified by four radiocarbon dates, and distributional information from surface-collected material adumbrates the total concept of this tradition.

The tradition results from convergence of the Perkiomen and Susquehanna phases. In the area below Milford the Perkiomen phase is the inspiration for Orient. The western division Susquehanna phase undergoes a similar transformation in the Milford area to produce Dry Brook. Continued convergence produces a single uniform Orient phase. This evolutionary process results in the fishtail form, and presumably the wider points such as Dry Brook and the serpent head are the early forms (Fig. 119 B). The narrow, slender Orient type (Fig. 119 A) is more common to the later Orient sites on Long Island and the Faucett site, although the Miller Field site has the full range of fishtail points.

The fishtail tradition is considered as the regional cultural transition between the Late Archaic broadspear tradition and Early Woodland. During this time stone bowls achieve their peak of acceptance and fired pottery makes its appearance in the Northeast. Settlement patterns and food procurement activities are similar to the preceding Archaic life style. Hunting, fishing, and collecting are largely implied

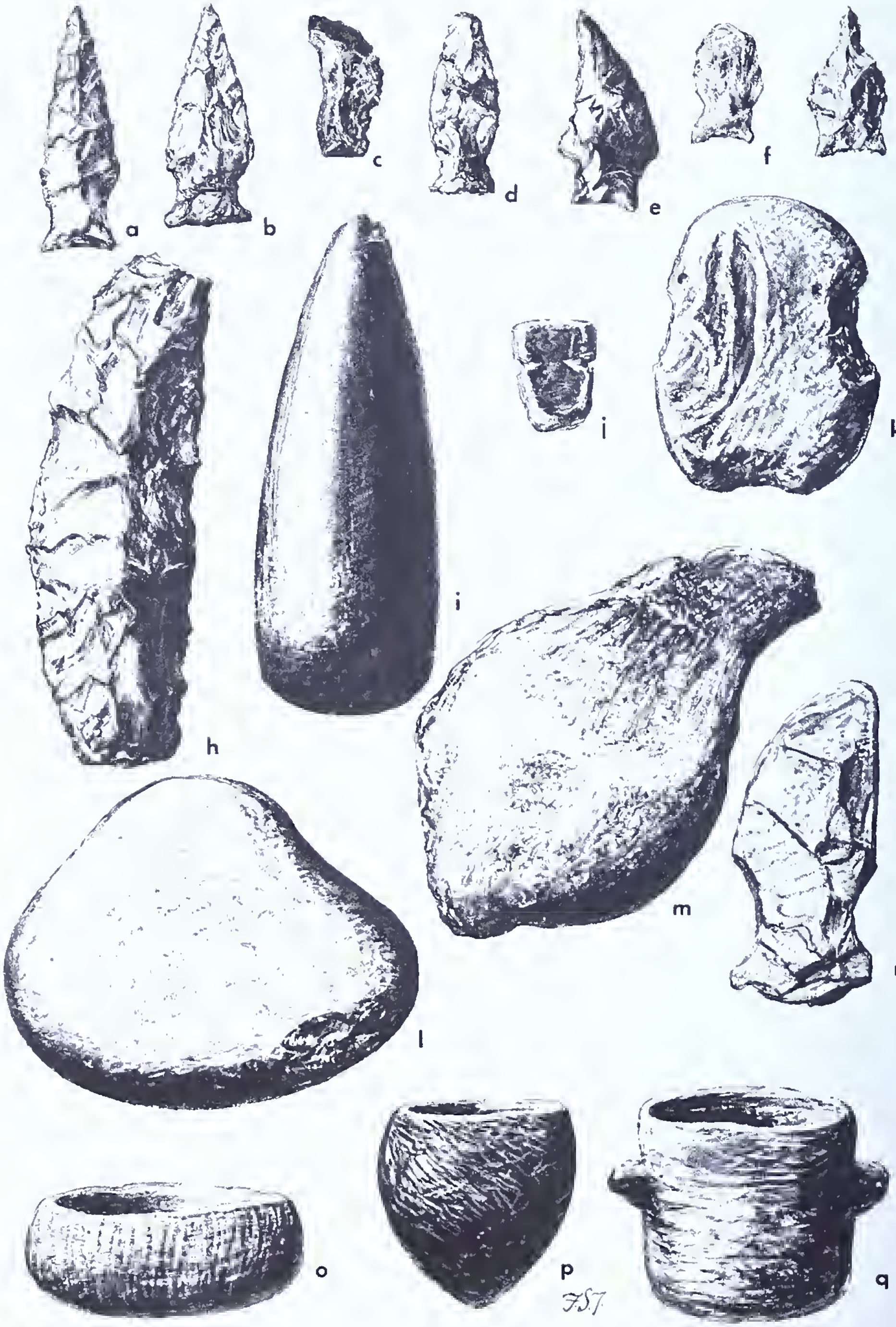


Fig. 106. TYPICAL ARTIFACTS OF THE ORIENT AND DRY BROOK FISHTAIL TRADITION: a, Orient fishtail point; b, Dry Brook fishtail point; c, flake knife; d, fishtail drill; e, fishtail knife; f, strike-a-light; g, fishtail drill; h, chipped celt or adze; i, polished adze; j, notched steatite bead or pendant; k, netsinker; l, milling stone; m, abrading stone; n, tie-on spear thrower weight. Vessels: o, smooth surface rounded steatite bowl; p, Vinette 1 and Exterior Corded/Interior Smoothed vessels; q, Marcey Creek steatite-tempered vessel.

from the stone tool assemblages rather than the survival of organic remains.

Fishtail components are among the most common archeological expressions in the Upper Delaware Valley, and Orient projectile points are exceeded numerically (8.0 per cent, 158) only by the generalized triangular group (10.4 per cent, 205). An estimated 35 to 45 sites are represented by Dry Brook and Orient points in the Macpherson Collection, and there is a continuous distribution of these types throughout the Delaware Valley. All but four of the sites reported in this volume yielded fishtail points, while five sites contained representative components.

Dry Brook Phase

Level 3 at the Zimmermann site provides important horizontal and stratigraphic evidence for the cultural content and the relative position of the fishtail tradition in Delaware Valley prehistory. Werner recognizes an early fishtail phase, which he has termed the Dry Brook phase on the basis of an extensive occupation at the Zimmermann site and the distribution for the Dry Brook point. A remarkable number of projectile points (271 and 20 rejects) have been recorded and classified as this type for that site. Chipped stone Dry Brook traits for the Zimmermann site include Dry Brook points, largely made of flints or cherts; drills reworked from projectile points; expanded base drills; projectile points reworked to form a chisel edge; scrapers; knives; strike-a-lights; quarry blanks; choppers; netsinkers; and numerous spalls. Polished stone tools are celts, an adze, and a spearthrower weight. Pitted and non-pitted hammerstones, abrading stones, a grinding stone (mortar), a nutting stone, a variety of anvils, and scarified stones are present. Soapstone is utilized to produce a three-holed gorget, pendants, several bead types, a ladle, and cooking vessels with lug handles. Soapstone vessels have both rough-tooled and smoothed exterior surfaces, with shapes varying from elongated with flat bottoms to oval and tub shaped. Hearths are numerous, with 21 of the 67 hearths of the large rock-filled platform type; the largest measures 22 feet across. This component is radiocarbon dated to 1280 B.C. ± 120 years. A minor Orient component consisting of eight Orient points, a large platform hearth, several stone tools, and possibly Vinette 1 pottery, was mixed with other Woodland assemblages in Level 2 at Zimmermann.

Orient Phase

A component from the stratified Brodhead-Heller site contains a mixture of 16 Orient and 11 Dry Brook points. Although not as detailed, the assemblage is almost identical with that found at the Zimmermann site. These traits include Orient and Dry Brook projectile points, drills made from projectile points, netsinkers, scrapers, choppers, a celt, grinding stones, mullers, utilized smooth stones, a soapstone bowl fragment, utilized flakes, and numerous spalls. An irregular rock-filled hearth is more than 30 feet in length, and it contained charcoal that is radiocarbon dated to 1170 B.C. ± 120 years.

An Orient component at the Miller Field site contains an impressive quantity of cultural material which serves to further enlarge upon the nonparochial nature of the Orient phase. At this site the component is radiocarbon dated to 1220 B.C. ± 120 years. In addition to the previously mentioned traits for related components at the Zimmermann and Brodhead-Heller sites, Kraft includes crescent-shaped knives made from projectile points, oval soapstone bowls, and a rich assortment of spalls utilized for a variety of cutting chores. There is also evidence of hot rock cooking. Marcy Creek steatite-tempered pottery is a notable trait for the Orient phase at the Miller Field site, and it is the only known local site to have this early pottery type. Because steatite-tempered pottery is more prevalent south of the Delaware Water Gap in the Piedmont of the Middle Atlantic Province, Kraft suggests that this pottery derives from that area.

The most recent radiocarbon date, 810 B.C. ± 100 years, for a local Orient component was obtained from a large rock-filled hearth, at the Faucett site. The relative stratigraphic position of this component places it between the Perkiomen and Meadowood components, and the several radiocarbon dates support the physical evidence. Traits include Orient projectile points; projectile points utilized as knives, drills, and scrapers; a notched spearthrower weight; heavy notched netsinkers; hammerstones; and possibly adze blanks. There is a preference for jasper in the manufacture of chipped stone tools, and jasper spalls are abundant. Exterior Corded/Interior Smoothed pottery is possibly a trait, and the evidence for the use of steatite is uncertain.

Eight Orient points and three tips, a Dry Brook point, a workshop consisting of a concentration of numerous chert spalls, a scraper, a knife, a muller, and a large oval rock-filled hearth (22 feet by 18 feet) constitute an Orient component at the Peters-Albrecht (36-Pi-21) site.

The excavation of four stratified sites, and a fifth site, all containing noteworthy fishtail components, together with distributional evidence for the diagnostic projectile point types considerably enlarges the previously held notion of this tradition. The chronology is supported

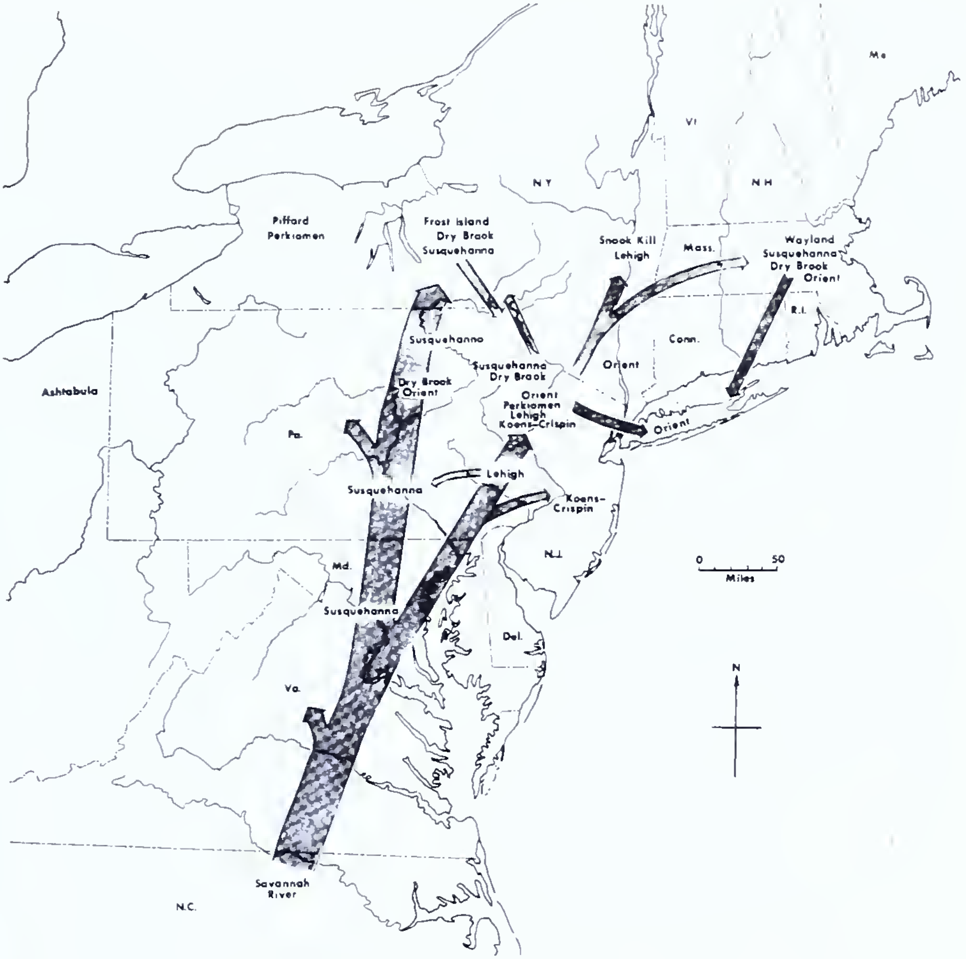


Fig. 107. MAP SHOWING THE LOCATION of the major known broad spear and fishtail phases for the Northeast.

by stratigraphy and four radiocarbon dates. These new data contradict Ritchie's (1965a 173) assertion that the Orient phase is fundamentally a provincial and prosaic culture achieving its climax on Long Island with minor extensions into southern New England and eastern Pennsylvania. Dincauze's (1968: 85-7) view of the Coburn group also requires some modification. Coburn is surely a participant in the emerging fishtail tradition, but it is unlikely that this group is the immediate ancestor of Orient as she suggests. While Coburn may be the medium through which Watertown phase traits were passed on to Orient, Coburn and Watertown did not enjoy an exclusive role in these events as implied. The broadspear phases to the south, especially Perkiomen, played a significant part.

Unlike the Orient sites on Long Island, no positively associated mortuary complex has been revealed in the Upper Delaware Valley. This trait is probably derived from the Watertown phase. Possibly Kraft found cremation burial(s) at the Miller Field site, but the evidence is too tenuous to be certain. Failure to find this trait may be due to the fact that the higher river terraces have gone largely unexplored. House types are unknown for both areas. In the Upper Delaware there is no indication that the Orient people utilized shellfish, but on Long Island this appears to be an important source of food. Although netsinkers are unknown for these components in the latter area, a few are associated with two sites, and possibly a third site, of this tradition in the Upper Delaware. It is suggested that migratory fish were a part of the diet for this area, and netting may have begun to play a more important role than spear fishing. Large rock-filled hearths, a trait of the preceding Perkiomen broadspear phase, carry over into the Dry Brook and Orient phases. Rock-filled hearths of this size are not reported on Long Island; the largest is 58 inches in diameter and is found at the Stony Brook site (Ritchie 1959: 27-8).

Four radiocarbon dates for components of this tradition range between 1280 B.C. and 810 B.C., for a time span of 470 years and a median age of 1120 B.C. Five radiocarbon dates for the Orient phase on Long Island range from 1043 B.C. to 763 B.C., for a time span of 280 years and a median age of 933 B.C. (Ritchie 1965a: Fig. 1). Upper Delaware Valley dates are significantly earlier (they average 187 years earlier) and the tradition endures nearly 200 years longer in this area than it does on Long Island. Clearly, the Orient and Dry Brook manifestations of the Delaware Valley contribute substantially to the development of similar components on Long Island. (Refer to Table 10 for a comparison of traits.)

In view of the apparent firmly established position of Vinette 1 pottery in New York, it is curious that Exterior Corded/Interior Smoothed should be significantly deeper than Vinette 1 in the stratigraphic profile at the Faucett site. Since Kraft has found Marcey Creek Plain associated with the Orient phase in the Upper Delaware, and a Middle Atlantic seaboard hearth seems assured for this steatite-tempered pottery, the question arises as to whether the primary source for the cord-marked ceramic series in the Northeast does not lie with steatite-tempered pottery. The sequence might be

$$\text{Marcey Creek Plain} \rightarrow \left\{ \begin{array}{l} \text{Stony Creek Corded-Marked} \\ \text{Marcey Creek Corded} \\ \text{Seldon Island Cord-Marked} \end{array} \right\} \rightarrow$$

$$\rightarrow \text{Exterior Corded/Interior Smoothed} \rightarrow \text{Vinette 1} \rightarrow \text{Later types}$$

New York and New England may have been the recipient of only the later part of this hypothetical sequence, but this is merely a tantalizing possibility.

The position is taken that a specific archeological complex may not necessarily have an identical pottery type associated at each component throughout a local area. The ceramics would surely be related, but in a given locality one Orient group may smooth the interior of their vessels, while in another locality others may allow the interior cord-markings to remain. This variance of practice might even be operative within lineages or families at a particular site. Ceramics are such a plastic medium that modest differences could reflect family and/or band preferences rather than chronology.

EARLY WOODLAND

MEADOWOOD PHASE

Until recently the Meadowood phase was largely known as a result of the excavation of burial components in central New York, although sites have been explored in the western and northern portions of the state (Ritchie 1965a: 179-80). In the last few years several Meadowood habitation sites have been excavated. Nahrwold 1 and 2 in eastern New York and the Scaccia site in the western part of the state are examples of Meadowood habitation sites (Ritchie 1969a: xxii-xxiv). The Meadowood occupation of the Upper Delaware Valley is light. Not more than nine site locations are represented by 11 surface-collected examples of the distinctive Meadowood point (Fig. 120A) from the Macpherson Collection. The type has been found in a subsurface context at only three sites.

Information for the Meadowood phase is obtained from an excavated component at the Faucett site, and its chronological placement is determined by a stratigraphic position superior to the Orient component and a radiocarbon date of 750 B.C. ± 100 years. The Faucett component is habitation with no evidence of cremation or human burial, and the occupation extends along a southwest to northeast line that is more than 220 feet long. Along this boundary there are no house patterns nor discernable features pertaining to the component, but there are three concentrations where Meadowood materials are found. Seventeen Meadowood side-notched projectile points (including fragments and cache blades), all made of Onondaga chert, constitute the major diagnostic trait for this component. A cache blade has a well-worn basal edge, and this suggests that it has been used as a tool.

Other traits are a broad flat gorget which has been drilled from one side and a pestle-like implement. It should be noted that food preparation implements are rare for Meadowood. A single muller represents this category of tools at the Vinette site (Ritchie 1965a: 188). Thick Exterior Corded/Interior Smoothed is the earliest pottery at the Faucett site, and it may be associated with either the Meadowood or the Orient components. In New York Vinette 1 is associated with Meadowood, but in the lower Susquehanna Valley a Meadowood component at the Oscar Leibhart site includes Exterior Corded/Interior Smoothed pottery (see pages 435, 454-5).

Meadowood traits were found in Level 2 at the Zimmermann site along with other Woodland manifestations. These include Meadowood points (13 of Onondaga chert, 3 of a dark gray chert), a hammerstone, pitted stones, a whetstone, triangular end scrapers, and three basin-shaped hearths with associated charred walnut shells. It is not exactly certain what pottery is associated, but it may be the Exterior Corded/Interior Smoothed (redware).

The Meadowood phase is known to have extended far from its apparent hearth in central New York. Trade and travel connections with the Atlantic coast, Quebec, the Upper Great Lakes, southern New England, the Susquehanna and Delaware valleys are hypothesized on the basis of cross-cultural diagnostic artifact traits (Ritchie 1965a: 195). The Faucett and Zimmermann components are but two examples of the extension of this phase into various major river systems of the Northeast.

A relative scarcity of Meadowood points (.6 per cent, 12) and other diagnostic traits such as tubular pipes and birdstones in the Upper Delaware Valley, the lack of a significant accumulation of occupational debris and features, and the paucity of spalls of Onondaga chert are reasons to infer that the local Meadowood occupation was brief and, in essence, migratory. In New York, four radiocarbon dates place its time span between 998 B.C. and 563 B.C. for an average date of 757 B.C. This average comes close to the Faucett site date of 750 B.C. I conclude that the distinctive and fully developed Meadowood groups penetrated the Upper Delaware as a consequence of their scattered trade-travel activities, and that this event occurred when the phase had achieved its climax in central New York. The Meadowood influence made no significant or lasting contribution to the prehistory of the Upper Delaware Valley.

MIDDLESEX PHASE

The Middlesex phase is regarded as the extension of Adena into widely scattered areas of the Northeast, with a concentration noted for central New York (Ritchie 1965a: 200-3). It is known exclusively from burial sites. The only excavated site in the Upper Delaware Valley with a notable Middlesex-Adena component is the Rosenkrans site in Sussex County, New Jersey. The site was dug in 1941, 1947, and 1948 by Lewis M. Haggerty, Hackensack, New Jersey, and his work was reported and discussed in detail by Carpenter (1950). It has also been treated in summary by Ritchie and Dragoo (1959; 1960) and by Ritchie (1965a: 203), and it is unnecessary to repeat a full discussion of this site.

In brief, the Middlesex component at the Rosenkrans site consisted of 13 graves of secondary, flexed, and cremated burials. Associated and diagnostic classic Middlesex-Adena artifacts include blocked-end tubular pipes, several styles of slate gorgets, pendants, cones, a copper boatstone, the bit of a copper celt, numerous copper beads, conch shell beads, large broad-stemmed Cresap-type points of Onondaga chert, finely chipped side-notched points of the same material, and other objects (Carpenter 1950: 298-303). Ritchie and Dragoo have noted that eastern Adena traits are greatest in frequency in the southern area of their range, and they diminish in frequency as they extend northward—nearly 100 per cent at Sandy Hill, Maryland; 89 per cent at Rosenkrans; 82 per cent to 64 per cent in western Vermont and at Long Sault Island in the St. Lawrence River (Ritchie and Dragoo 1959: 46; Ritchie 1965a: 201).

The Rosenkrans site has a surprisingly early radiocarbon date of 610 B.C. ± 120 years (Ritchie 1965a: 203). This date is earlier than many of the dates for Adena in the Ohio Valley, and it is earlier than eight dates for Adena in the Delmarva Peninsula. If it is correct it casts doubt on the assumption that Adena moved into the Northeast from the Delmarva Peninsula via the Delaware Valley. The Rosenkrans site would have to be interpreted as an Adena settlement at a time when the culture was flourishing in the Ohio Valley.

However, there are some hints that not all the Rosenkrans traits are of the early to middle Adena period. The Cresap-like points, the blocked-end tubes, a concave gorget, and the cones of hemispheres resemble early to middle Adena traits, while the finely made side-notched points, the copper celt, and the rectangular gorgets are more typical of late Adena and Hopewell. Shell and copper beads are found in both early and late Adena mounds and on Hopewell sites. Boatstones have a dubious value as chronological markers since their history can be traced from Late Archaic through Adena and Hopewell (Dragoo 1963: 194). The Rosenkrans boatstone is an elaborate copper form which may be a late specimen.

In any event the Rosenkrans site is the only instance to date of cremation burials in the Upper Delaware Valley. The impact of Middlesex-Adena culture in the area appears to be no more profound than the influence of Meadowood culture. If the Rosenkrans and Faucett radiocarbon dates are correct, then these two traditions might not have been locally separated by more than 140 years.

Middle Woodland

Bushkill Complex (Fig. 108)

Although a limited number of distinctly Middle Woodland components have been isolated in the Upper Delaware Valley, the Rossville point, which is diagnostic for the period, is a common surface find. The type occurs with an overall frequency of 5.8 per cent (113), which places it among the most prevalent projectile point types; Lagoon points (Fig. 120 C), .8 per cent (15), are much less common. Thirty to thirty-five sites are represented by the Rossville points (Fig. 120 B) in the Macpherson Collection. The fullest Middle Woodland expression is an extensive cultural assemblage from the Faucett site which, together with similar but minor components at Brodhead-Heller, Brodhead, Miller Field, and Zimmermann sites, have been termed the Bushkill complex.

Stratification at the Faucett site is of considerable assistance in the identification and interpretation of this complex. At that site a component of the complex lies above the Meadowood occupation and beneath the Owasco and Tribal components, although pits from these two late manifestations occasionally intrude into the upper levels of the Bushkill occupation. At the Brodhead-Heller site one Rossville point (two others of this type were collected on the surface) and generalized side-notched points (4) were found near the top of the tan alluvium above the Orient hearth in probable association with a relatively small amount of Early Series pottery. Late Woodland pits disturbed this component as they did at the Faucett site. Other sites with associations of similar pottery types and projectile point types lacked good stratigraphy. In a mixed Woodland context from Section 2, Level 2, at Zimmermann, a small Bushkill assemblage has

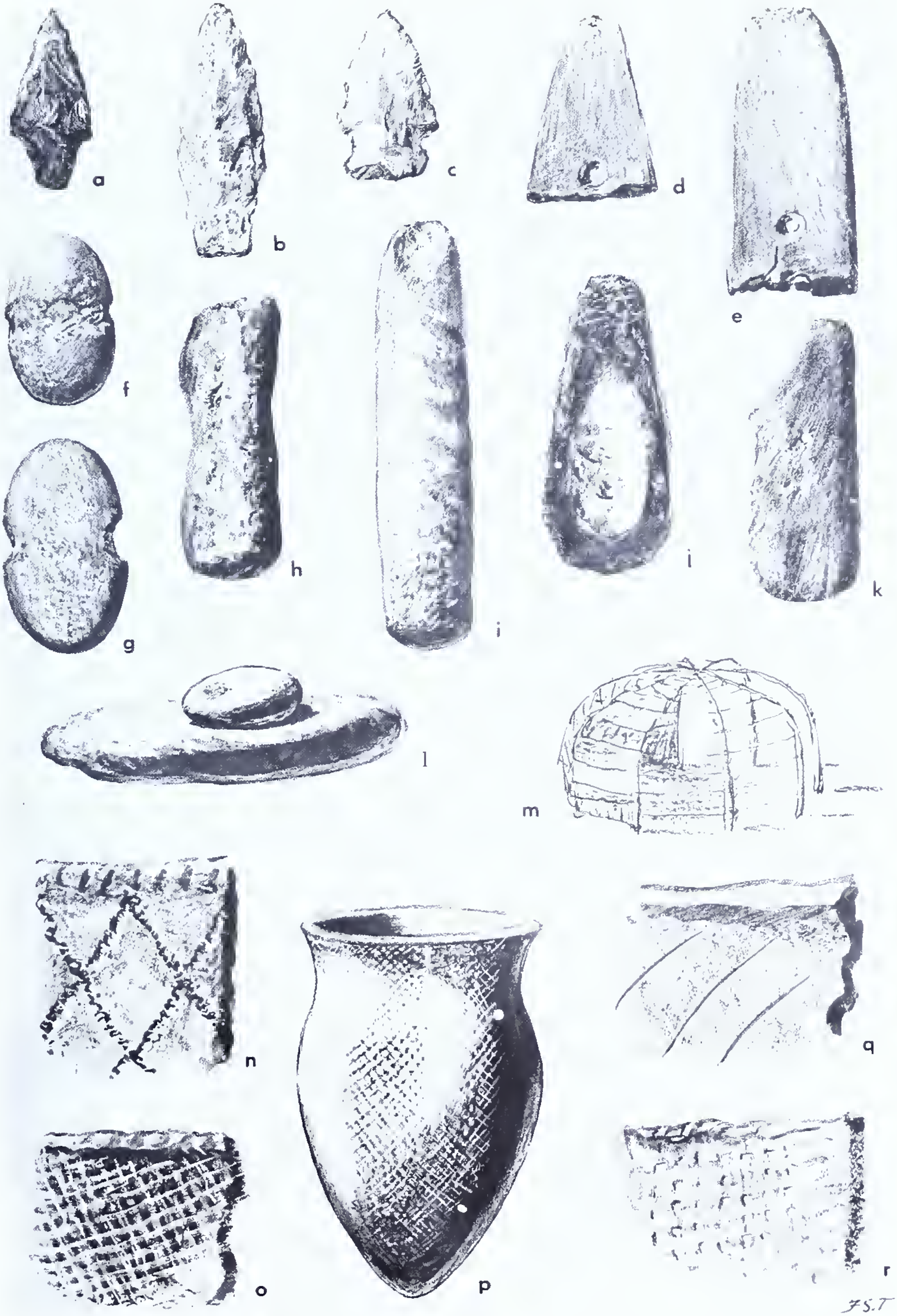


Fig. 108. TYPICAL ARTIFACTS AND TRAITS OF THE BUSHKILL COMPLEX: a, Rossville point; b, Lagoon point; c, generalized side-notched point; d, e, gorgets; f, bola stone (or possible netsinker?); g, netsinker; h, pestle-like implement; i, pestle; j, celt; k, bipitted adze blank; l, muller and grinding stone; m, possible house type. Pottery: n, Dentate-Stamped; o, Vinette 1; p, reconstructed vessel of the Brodhead Net-marked type; q, Wiped; r, Fabric-impressed.

been isolated. These traits include Lagoon, Rossville, small broad-stemmed points (Lagoon ?); Dentate-Stamped, Vinette 1, Exterior Corded/Interior Smoothed, and Wiped pottery; pitted stones; knives; two hearths; and a flint workshop. At the Brodhead site, where the distinctive net-marked pottery was first recognized (Kinsey and Kent 1965: 130, Fig. 3), there is a minor Bushkill component consisting of Early Series pottery; Rossville, Lagoon, and generalized side-notched projectile points; and workshop areas mixed with other Woodland assemblages. The presence of a Bushkill component at these sites is determined largely by typological considerations and by horizontal propinquity.

The Bushkill occupation at the Faucett site is nearly continuous throughout the excavated area. Most of the diagnostic materials were not found in distinct features. They were located in somewhat vague and poorly defined disturbances representing trampled living surfaces and workshop areas. No hearths or fireplaces can be assigned with certainty to this occupation. A circular-to-oval postmold pattern measuring 25 to 30 feet in diameter represents the probable house type.

The Bushkill complex is related to the recently defined Lagoon complex on Martha's Vineyard, Massachusetts (Ritchie 1969b). Although there is no abundant statistical evidence, there is a distinct tendency for the Lagoon point to be dominant in the early components of that complex, with the Rossville point becoming the majority type in later components. The following tabulation illustrates this change in frequency of projectile point types for the Lagoon complex.

Site	*Stratum*	*Lagoon*	*Rossville*	*Date*
Pratt	3	5	1	520 B.C. ± 120
Pratt	2	8	2	430 B.C. ± 80
Peterson	2A	3	2	360 B.C. ± 80
Vincent	2A	1	4	100 B.C. ± 80

During this span of time from the late Early Woodland to early Middle Woodland, 520 B.C. to 100 B.C., there is a progressive increase in the number of Rossville points with an accompanying diminution in the number of Lagoon points.

For the Bushkill complex at the Faucett site, the dominant point type is Rossville (60.5 per cent, 29), and these are fashioned principally from locally available black flints and argillaceous shales. A minority type is Lagoon (29.0 per cent, 14) which is made of similar lithic materials and argillite, while generalized side-notched points are present in even smaller numbers (10.5 per cent, 3). If the trends established by the data for the Lagoon complex on Martha's Vineyard are valid for the related Bushkill complex in the Upper Delaware Valley, it follows that the latter is contemporary with Lagoon during the later period of the sequence. On the basis of extrapolated data, the date for the Bushkill complex at the Faucett site is 300 B.C. to 100 B.C. A few traits of the Bushkill complex, Brodhead Net-Marked and Vinette 1 sherds, and Rossville-like points were found by Kraft on the Miller Field site. The net-marked pottery was located close to Hearth 5, which yielded a radiocarbon date of 480 B.C. ± 80 years, and this is regarded as an acceptable date for the Bushkill complex. A radiocarbon date of A.D. 790 ± 120 years from the upper levels at the Faucett site is considered to be too recent. It is unlikely that Bushkill would postdate Kipp Island and be approximately contemporaneous with Hunter's Home.

It is noteworthy that unnamed side-notched points are found in Lagoon components at three sites on Martha's Vineyard. A parallel situation exists for the Bushkill occupation at the Faucett site and possibly at the Brodhead-Heller site where certain unnamed side-notched points are considered to be a trait of this complex.

Ritchie (1969b: 224) remarks on a similarity between Lagoon and Adena (Cresap Stemmed ?) types as well as an approximate chronological correspondence. Adena points and blades, however, are much more finely chipped than Lagoon and Rossville points, which exhibit a closer resemblance to certain regional Late Archaic types and to projectile point types of other local cultural horizons. Adena influence may be present, but other factors seem to exert a greater influence. For example, a similarity in form exists between Lagoon, Lackawaxen Stemmed (Straight Stem subtype), Fox Creek, and Ritchie's (1961: 51-2) Steubenville Stemmed and broad-stemmed points (see pages 444-5) in the Northeast. This correspondence is stronger between Rossville and the Converging Stem subtype of the Lackawaxen Stemmed than the finely made Adena ovate-base (Cresap type) points. These morphological carry-overs from Late Archaic through Early and Middle Woodland can more readily be attributed to the persistence of a generally conservative Piedmont projectile point tradition than to Adena influence. Without proper context it may be nearly impossible to determine the cultural provenience of particular specimens within one of these typologically similar series. The absence of diagnostic Adena traits in either the Lagoon or Bushkill complex, plus the fact that Lagoon and Rossville points are fashioned from local lithic materials rather than exotic flints and cherts limits the force of any suggestion of Adena influence.

Several types of Early Series pottery are considered as traits of the Bushkill complex: Vinette 1, Fabric-Impressed, Wiped, and Dentate-Stamped. The dominant type is the newly recognized Brodhead Net-Marked. Although Salwen's terminology differs, the Bushkill ceramic complex corresponds to a similar association of related pottery types from the deeper midden, Occupation A, at the Muskeeta Cove site on Long Island (Salwen 1968). A notable exception is that Salwen found Modified Interior Cord-Marked pottery with these other types, whereas the obviously similar Exterior Corded/Interior Smoothed is found with earlier components at the Faucett site. Five shell-tempered sherds are from the upper zone of Occupation A at Muskeeta Cove, although these may be intrusive.

On the basis of ceramic identifications, Component A at Muskeeta Cove is identified with the Windsor tradition of the North Beach focus. Its age is placed in excess of 1,000 years (Salwen 1968: 337-9), but an age of at least 2,000 years is likely to be more nearly accurate. The scarcity of chipped stone tools prevents the identification of the projectile point type(s) for North Beach, but Smith (1950) illustrates probable Rossville and Lagoon points for sites in coastal New York.

On Martha's Vineyard, Vinette 1 pottery is the majority type at four sites of the Lagoon complex. Grit-tempered and shell-tempered pottery is found in the same strata with Lagoon- and Rossville-type points and Vinette 1 pottery at the Pratt, Cunningham, and Vincent sites (Ritchie 1969b: 78-9, 111, 151-2).

In addition to the Rossville, Lagoon, and side-notched points and the Early Series pottery, there are a number of other traits for the Bushkill complex. Household and food preparation implements include hammerstones, mullers, grinding stones, pitted stones, anvils, and pestles. Woodworking and other cutting tools are adzes, celts, biface scrapers, and heavy roughly chipped teshoa choppers. Notched netsinkers were utilized for fishing. Small river pebbles, with a lateral groove, have been identified as bola stones. It is possible that this functional identification is incorrect and that these implements were utilized as weights on fish nets. Narrow subrectangular gorgets are another trait of the Bushkill complex. Presumably, the spearthrower was in use, although no true spearthrower weight was found (unless gorgets are weights). Table 11 compares traits of the Bushkill and Lagoon complexes and the Muskeeta Cove site.

A balanced economy based upon hunting, fishing, and the collecting of wild fruits, berries, and nuts can be inferred from the assemblage.

The only animal bones preserved that can be attributed with certainty to this complex are those of a raccoon. No other organic remains were found associated with this occupation. The absence of freshwater mollusks is curious in light of the evidence for the utilization of salt-water shellfish by apparently related and contemporary groups on Long Island and southern New England (Salwen 1968; Ritchie 1969b: 217). However, it seems likely that this apparently negative trait for the Bushkill complex is caused by poor preservation and perhaps by the limitations of the size of the sample. The Bushkill complex represents an adaptation to riverine conditions, while elsewhere in the Northeast similar groups were exploiting a coastal environment.

It is felt that it is likely that too many projectile point and pottery types have been identified as traits for this complex to represent the original ethnological conditions. When additional information is derived from a satisfactory context, it may be possible to subdivide the present complex into several phases. With the data at hand, further separation of these traits would be arbitrary.

Middle and Late Point Peninsula

No Hopewellian components have been excavated in the Upper Delaware Valley. However, some of the Adena-Middlesex artifacts (rectangular gorgets, copper celt, boatstone, beads, finely made side-notched points of Onondaga chert, and possible Pan pipes) from the Rosenkrans cemetery would be just as much at home on Point Peninsula sites or sites of the Squawkie Hill phase (Carpenter 1950: 313; Ritchie 1965a: 226). The straight-based platform pipe of anhydrite in the Macpherson Collection illustrated on Figure 122 and described on pages 449-50 from the Rosenkrans Ferry site could be either a Hopewellian or a Kipp Island product. Some of the rather crudely executed generalized side-notched projectile points (Fig. 121 D) might be unobserved indicators of the Hopewellian tradition, but since these are surface-collected it is fruitless to speculate further on this possibility.

Kraft (1969b: 15-6, Pl. V) has described a petroglyph from Minisink Island made from a red sandstone slab that measures about 12 inches square. A design of well-formed hands was pecked into the surface and the work was completed by polishing. The final product is an excellent example of skilled artisanship. Kraft is almost certainly correct in identifying the specimen as of Hopewell influence and in comparing the style and motif to the copper and mica hands of that culture.

Table 11. Comparison of Traits of the Bushkill and Lagoon Complexes.

	Bushkill Complex			Lagoon Complex								
Traits	Faucett	Brodhead-Heller	Brodhead	Pratt #3	Pratt #2	Vincent #2	Vincent #2A	Howland #2	Cunningham #3	Cunningham #2	Peterson #2A	Musketta Cove A
Projectile points												
Rossville	X	X	X	X	X	X	X	X	X		X	
Lagoon	X		X	X	X		X	X	X	X	X	
Side-notched	X	X	X	X		X		X	X			
Scrapers												
Biface	X											X
Side											X	
End				X					X	X		
Knives		X		X	X	X		X	X	X	X	
Bone & Antler Artifacts												
Awls				X	X	X			X	X	X	
Worked beaver incisors				X	X					X		
Antler flaking tools				X	X				X	X	X	
Rough & ground stone												
Choppers (teshoa)	X									X	X	
Netsinkers	X											
Anvil stones	X				X						X	
Pestles	X										X	
Whetstones				X							X	
Hammerstones	X			X					X	X		
Gorgets	X											
Adzes (blanks)	X			X						X		

Table 11. Continued

	Bushkill Complex			Lagoon Complex								
Traits	Faucett	Brodhead-Heller	Brodhead	Pratt #3	Pratt #2	Vincent #2	Vincent #2A	Howland #2	Cunning-ham #3	Cunning-ham #2	Peterson #2A	Musketta Cove A
Celts	X											
Mullers (grinding stones)	X											
Pitted stones	X											
Paint stones				X		X		X	X		X	X
Bola stones	X											
Spearthrower wts.				X								
Pottery												
Vinette 1	X	X	X	X	X	X	X	X			X	X
Brodhead Net-Marked	X		X									X
Fabric-Impressed	X	X	X									X
Wiped	X		X									X
Dentate-Stamped	X	X										X
Grit-tempered			X			X	X		X	X	X	
Shell-tempered						X	X		X	X	X	?
Grit- & shell-tempered									X	X		
Features												
Scattered living floors	X		X	X	X	X	X		X	X	X	
Lithic work shops	X			?	?	X	?	?				
Circular houses	Probable								Arcs	Arcs		
Middens				X	X	X	X		X	X	X	

Throughout the valley, Point Peninsula pottery is scarce and only two relatively small components of the Kipp Island phase have been isolated. Both Ritchie (1949: 160; 1969a: 235) and Carpenter (1950: 313) have reported the presence of an apparent cremation burial, excavated by others on Minisink Island, having a classic late Point Peninsula bone comb, two perforated shark's teeth, and a fragmentary straight-based platform pipe of steatite as associated traits. Werner observes a number of diagnostic Kipp Island traits from Level 2 in the Zimmermann site. This component includes Jack's Reef Corner-Notched (1), Jack's Reef Pentagonal (3), prismatic flake knives, end scrapers, triangular knives, blanks, an abrading stone, grooved and notched pebble sinkers, and a slate pendant. Other Kipp Island traits at the site are a ground slate knife, thick side-notched points, a beaver incisor, an adze, probably a chopper, and Point Peninsula pottery. Projectile points and pottery types diagnostic for this phase have been excavated with mixed assemblages at Faucett, Brodhead, Peters-Albrecht (36-Pi-21), Manna, and other local sites.

The distinctive Jack's Reef Corner-Notched and the Jack's Reef Pentagonal points (Fig. 120 E, F), which are diagnostic for the Kipp Island phase and continue in use until Hunter's Home (Ritchie 1965a: 243, 254), are relatively uncommon. For the Macpherson Collection the former has a frequency of .4 per cent (8), representing only two or three sites, and the type has been excavated in mixed associations at five sites. The Pentagonal type has a .3 per cent frequency (7). It has been excavated at four sites, and Werner reports that 26 examples are associated with late Point Peninsula pottery (Point Peninsula Corded and Jack's Reef Corded), constituting a Hunter's Home phase for the Manna site.

Hopewellian, Late Point Peninsula, Kipp Island, and Hunter's Home influences are presently known by comparatively meager evidence. A few diagnostic artifacts, including a small amount of Point Peninsula pottery, attest to the presence of these traditions. It is likely that these influences may be attributed to the use of the Delaware Valley as a trade route to the Delmarva Peninsula. The latter area is a source for fossil shark's teeth, and it is the location of the Island Field site, which contains an extensive burial complex (flexed burials, but full and partial cremation burials are present) of the newly recognized Webb phase (Thomas 1969: 14). Probably the dates for these several traditions in the Upper Delaware are synchronous with comparable manifestations in New York, which are considered as the immediate source for these cultural expressions. It is felt that the radiocarbon date of A.D. 790 ± 120 years for the Faucett site pertains to a minor Kipp Island component.

LATE WOODLAND

OWASCO-TRIBAL (Figs. 109-113)

Except for small midden deposits at the Zimmermann (page 67), and Bell-Philhower sites (Ritchie 1949: 165), none of the Late Woodland components has observed middens resembling those described for sites in eastern New York with Owasco and Iroquois occupations (Ritchie 1952: 6-13; Ritchie, Lenig, and Miller 1953: 23-4; Lenig 1965: 19-24). An estimated 90 per cent of the information pertaining to the Late Woodland in the Upper Delaware Valley was retrieved from the abundant man-made pit features. Very little waste material, which normally would be scattered throughout a village area, was found.

A factor contributing to the apparent absence of middens is the excavation procedures. Because the area is to be flooded, Kraft, Marchiando, and Kinsey conducted salvage archeology that took the form of site survey, limited testing, or extensive testing. Bulldozers were utilized to remove the topsoil because they were the most efficient and economical method of achieving optimum results. Generally, only a limited amount of topsoil was screened. Artifacts and debris that had resided in the uppermost portion of the pits were scattered by plowing, and this material was not always retrieved. This procedure saved time, and for the amount of available resources it permitted maximum horizontal exposure of the undisturbed subsoil. But since there has been little accumulation of topsoil and limited deposition by over-bank flooding, shallow middens that may have been present at the junction of the topsoil and subsoil could have been destroyed by the bulldozer. Care was exercised to avoid this occurrence by observing the bulldozed area, but under such circumstances it is possible to miss thin deposits.

That a large number of pits have been excavated is attested to by the following tabulation:

Site	*Excavator*	*Number of Pits*
Miller Field	Kraft and Staats	621
Eleven Sites	Kinsey	320
Bell-Philhower	Ritchie and Philhower	300
Bell-Browning	Marchiando	270
Zimmermann	Werner	238
	Total	1,749

The total would be considerably larger if the unspecified number of so-called "feast-pits" dug by Heye and Pepper (1915: 60, 67-70) and the number dug at a variety of sites by various persons and organizations over the past 50 years were known. A conservative estimate is that more than 3,000 pits of Late Woodland origin have been excavated in the Upper Delaware Valley. Unfortunately, pit archeology provides a disappointingly low yield of useful data. It is of little assistance in the establishment of a chronology. Pits provide unsatisfactory evidence for the isolation of the various components, and they are wanting in supplying information on settlement patterns. Generally, pits are found randomly dispersed throughout the site plot in no discernible or meaningful pattern.

A high percentage of pits were either sterile or they contained nondiagnostic materials. Werner found 58.0 per cent of the Zimmermann pits to be in this category, Kinsey found this to hold for 72.2 per cent of his pits, while Ritchie (1949: 167) reports 45.0 per cent sterile or nearly sterile for Bell-Philhower. Additional information provided by Kinsey's pit data shows 14.7 per cent (47) contained diagnostic Tribal rim sherds, 5.3 per cent (17) contained diagnostic Owasco rim sherds, and 7.8 per cent (25) held a mixture of Tribal and Owasco pottery. Profile drawings are available for 643 pits, and of this total the following shapes are noted: basin 33.4 per cent (204), bell 30.8 per cent (199), saucer 14.1 per cent (91), deep basin 7.5 per cent (48), cylindrical 7.4 per cent (47), shallow cone 3.9 per cent (25), and cone 2.9 per cent (19).

With the possible exception of the Kutay site, I believe that all pits found at a particular site are not the result of a single occupation. Multicomponent Late Woodland occupations are presumed to be present, but it is impossible to delimit the several components. Even in those instances where pits contain sherds exclusively of one series there can be a diversity of types. The association does not necessarily represent a manifestation of a single component. Attempts were made to relate the distribution of pits to a meaningful settlement pattern, and also to determine if a relationship exists between the distribution of pits and ceramic types throughout a site. These efforts have not been successful in establishing a recurrent pattern. Some generalizations about pits are possible, but no claim is made that these remarks are especially significant.

Pit locations conform to different patterns at different sites. At McCann, Kutay, Peters-Albrecht (36-Pi-22), Miller Field, and Bell-Browning sites, pits tend to be concentrated in clusters. Pit density is particularly pronounced at the latter site. None of these clusters forms a recognizable settlement pattern. Sites containing relatively heavy Munsee and late Tribal occupations (Zimmermann, Miller Field, and Bell-Browning) exhibit the greatest concentration of pits. In view of the large number of pits encountered, it is somewhat remarkable that more do not intersect. Pits intersect in 20 to 25 instances at sites where the late occupations are most intensive. In order of frequency this occurs at Zimmermann, Bell-Browning, Miller Field, McCann, Faucett, and Kutay sites. Some pits are adjacent to others without intersecting. At the Faucett and Zimmermann sites, pits are generally located within a wide belt on a slight elevation, which provides drainage and extends for several hundred feet. Kraft has shown for the Miller Field site that deep storage pits are found inside the three longhouses. A majority of pits at Lee's Terrace pertain to a Tribal component, and these are aligned in such a way as to suggest their possible inclusion within a longhouse.

Postmolds surround Pit 7 at the McCann site and Pit 85 at the Kutay site, and these indicate the likely presence of an enclosure over the pit feature; a similar structure was present at the Miller Field site. Also in a number of instances at the latter site, postmolds were observed to be present on opposite sides of the same pit. A few pits appear to have been lined either with bark or grasses for better preservation of the food contents. The specialized features at McCann, Kutay, and Miller Field sites might contribute to the better preservation of food for some specific purpose. A few pits show lenses and stratification, but there is insufficient data available to establish a chronology based upon this type of evidence.

No correlation has been noted between pit shape and contents, except for the natural tendency of the larger and the deeper pits to yield a greater amount of material than the smaller features. Some have a diameter of as much as seven feet, and they extend to a depth that is nearly equal to the diameter. Both Marchiando and Kraft have found a substantial number of cylindrical silo-shaped pits. These are considered to pertain to the late Prehistoric-to-Historic Munsee component. They are apparently specialized food storage features. Postmolds were located at the bottoms of some of these pits at Miller Field, which Kraft suggests may relate to an internal structure such as a ladder, shelves or a rack, support for a cover, or any combination of these. He found a number of pits of this type to have puddled walls that served as a retardant to moisture. Marchiando found caches of potter's clay in four pits of this type.

Kinsey's data shows that Owasco pottery is not associated with cone-shaped pits, nor is Tribal pottery found in shallow cone-shaped pits. However, this may be a factor of the limited size of the sample.

Pit contents consist of broken pottery, various discarded stone tools, waste chippage, fragments of animal bone, freshwater mussel shell (mostly *Elliptio complanatus*), and occasionally charred organic material such as corn, beans, and nuts. This is household refuse produced by normal daily activities. The assumption is that most of it found its way into pits as a result of house and village cleanup. It is possible to speculate that the cleaning might on occasion be related to the ritual cleansing in the Delaware Big House Ceremony (Speck 1931: 151) or the Iroquois New Year or Mid-Winter Festival.

A second assumption is that a great majority of the pits were dug as food storage receptacles. As individual pits were emptied of their contents they became convenient repositories for the disposal of trash. It is hardly possible to determine which pits might have been repaired and used again for storage. A normal cycle would be for pits to be dug in the fall in order to store the harvest. Over the winter months they were divested of their contents. Pits located inside a house would have to be roofed over if they were to be reused, and if they were used for the disposal of trash they would have been filled to floor level in order to provide an even floor.

When a site was abandoned some pits would have been filled with midden debris while others would have remained open. In time, all open pits would begin to fill by natural wash. If no more than about 50 years or so elapsed, and providing there was no major flooding, slight depressions would remain. Some pits might be redug and used by the next group of Indians to camp at the site. This results in debris from the early group and the later group becoming mixed. The cycle could be repeated many times over a span of 400 to 500 years.

This hypothetical reconstruction accounts for the presence of mixed cultural assemblages in some pits, while the contents of other pits are the product of a single component. Since a relatively small percentage of pits intersect, I am inclined to believe that the locations of the original pits were usually known to the later occupants. Elapsed time between the various late components was not great. In some instances the integrity of the older pits was maintained, while others were cleared and reused.

BURIALS

Thirty-nine burials are reported for the various sites excavated by Kraft, Werner, Marchiando, and Kinsey. By and large the state of preservation of the skeletal material is very poor and the sample is inadequate for meaningful osteometric observations. However, some inferences can be made about the care and disposal of the dead.

In those instances where the mode of burial was known, the body had been placed in a flexed position. Ritchie (1949: 168-9) found three flexed burials during the excavation of the Bell-Philhower site. However, extended burials are also known for the area. Heye and Pepper (1915: 30) found 28 extended, 17 flexed, and 23 indeterminate burials at the Munsee cemetery site. Most graves are scattered throughout the site and village plot. There is no consistent pattern to burial location nor are there organized cemeteries. Werner's data for the Zimmermann site show a tendency for the body to be aligned along a north to south and a northeast to southwest axis. The head was placed to the south and southwest and generally the face was positioned to the east. Burials at Peters-Albrecht (36-Pi-21) and the Faucett site also follow this pattern.

Graves are shallow and they usually lack offerings. Two Historic period burials at the Miller Field site and those at the Munsee cemetery contained grave offerings. Probably most of the 39 burials pertain to the Owasco and early Tribal occupations. Little effort was made to honor and provide the dead with useful goods for an afterlife. Sometimes the body was simply placed in a convenient refuse pit which was then filled with earth and scattered debris. These burial customs generally conform to those described for Owasco in New York (Ritchie 1969a: 296).

Dog burials are not uncommon for the Upper Delaware Valley. Nine have been reported including two in the Munsee cemetery (Heye and Pepper 1915: 59) and one at Bell-Philhower (Ritchie 1949: 170). With one exception the dog burials were found on the New Jersey sites. There is the suggestion at the Miller Field site (page 8) and at the Davenport site (Leslie 1968b: 128) that dogs were occasionally used as a source of food.

Ceramics (Figs. 109-112)

The discussion of Late Woodland ceramics is largely based upon previously described Owasco-Iroquois ceramic types (Ritchie and MacNeish 1949; MacNeish 1952; Lenig 1965). The typologies are somewhat modified in order to fit the local situation. (Refer to the Appendix for these descriptions).

Late Woodland ceramics are varied and with the passage of time

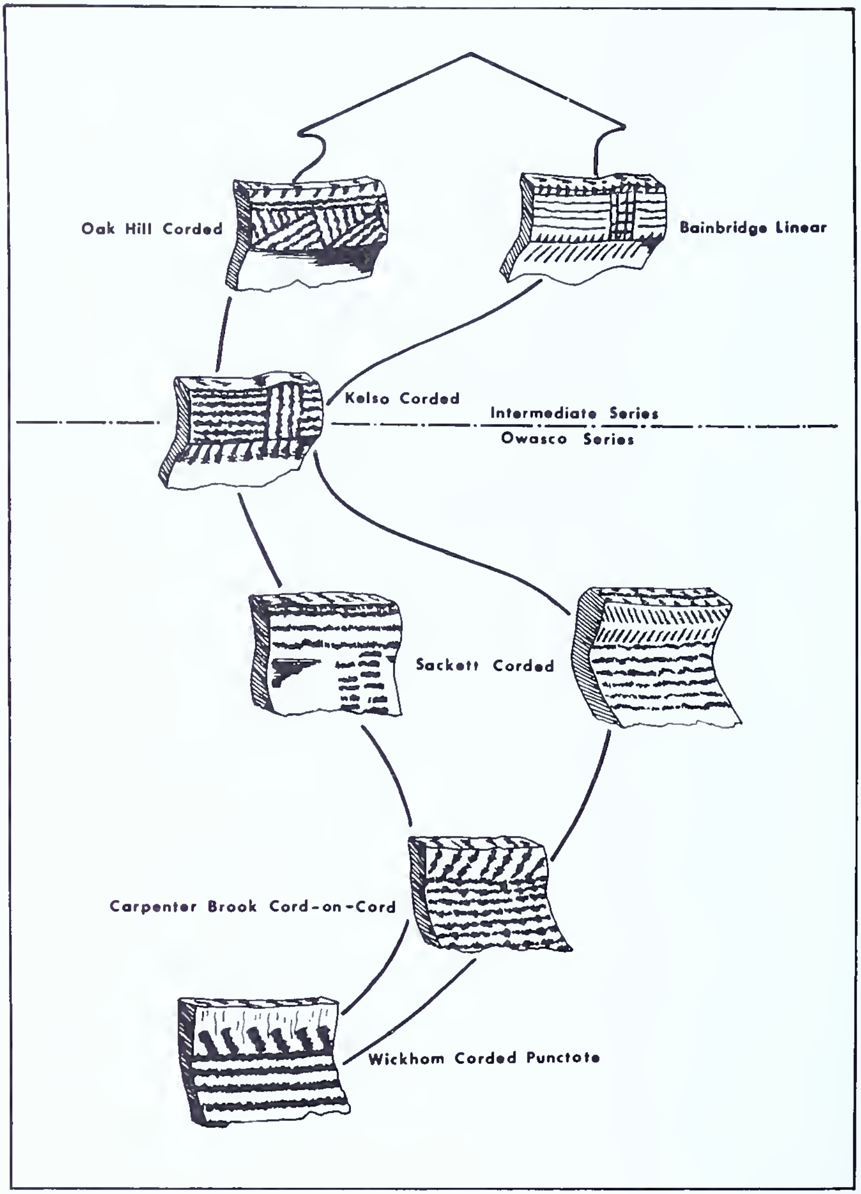


Fig. 109. OWASCO AND INTERMEDIATE SERIES CERAMIC TRENDS.

they become increasingly complex. Attempts to establish a plausible chronology by means of ceramic seriation met with little success (**Fig.** 112). Pottery is subsumed under two major series, Owasco and Tribal, and these categories are determined by decorative technique and motif. Rim sherds are easily classified as to series or ware group, but the recognition of specific types can be difficult to ascertain because of stylistic variations. Departure from the established type results from minor embellishments such as an additional band of corded or incised impressions applied to the rim or shoulder. Occasionally, body surface finish varies from the normal cord-marked (Owasco) or smoothed (Tribal) treatment.

Two possible factors contributed to the large number of divergent pottery styles. One factor was that the Upper Delaware was marginal to the Owasco hearth in central and eastern New York, and distinctive style motifs and techniques of execution evolved independently. The second was that with increasing ceramic diversity there was a pro-

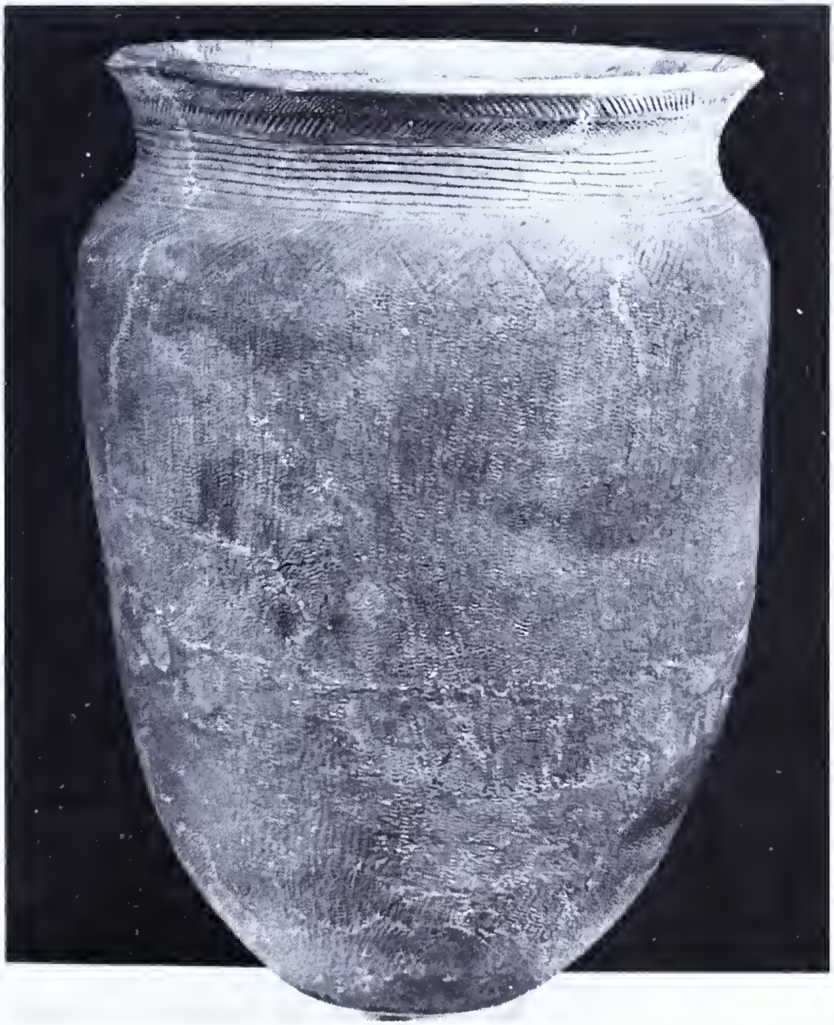


Fig. 110. LARGE SACKETT CORDED TYPE VESSEL with corded triangular plat decoration applied to the shoulder, from Minisink Island, Walter Franke Collection, University Museum, Seton Hall University. Height 27 inches, greatest diameter 18 inches.

liferation of types and less uniformity, and this trend continued to the seventeenth century. This accounts for the variant ceramic forms that have a distribution limited to one or two sites. They include Platted Punctate and Notched Lip, Zimmermann site variants (Fig. 29, No. 2; 37, Nos. 8, 9) ; variant Owasco Corded forms from the Miller Field site (Fig. 10 D, G) ; and Late Woodland Plainware, Ministerium variant (Fig. 74 A) . Bell-Browning site pottery has several unusual forms of surface treatment (Fig. 45 A, E) and a vessel of the Sackett Corded type with body treatment done in a crisscross corded technique (Fig. 45 D) . An unusual corded-punctate vessel is noted for the Brodhead-Heller site (Fig. 85 M) .

Owasco pottery (Fig. 109) shows the expected characteristics: cord-marked exteriors, smoothed interiors, a collarless vessel form evolving to low and incipient collars with linear motifs in the form of plats, and horizontal or oblique elements made with a cord-wrapped tool. Decoration occurs primarily on the collar, but it also appears on the neck and shoulder. Beading or shallow punctation is present on a few Castle Creek forms and a few exhibit rudimentary attempts at incising. Crushed quartz, chert, granitic rock, and mica grit are used as tempering agents.

The earliest Owasco pottery types (Wickham Corded Punctate, Carpenter Brook Cord-on-Cord, Levanna Cord-on-Cord, and Canandaigua Plain) are present but in relatively small frequencies. Clemson Island pottery occurs at a few sites, and locally it seems not to have been a principal source for late Owasco pottery. Canandaigua Plain, Levanna Cord-on-Cord, Carpenter Brook Cord-on-Cord, and Wickham Corded Punctate, although not abundant in the Upper Delaware Valley, have an important center of distribution in the Milford-Minisink area. Bell-Philhower, Zimmermann, and Miller Field are sites where these types enjoy their greatest popularity, although the Miller Field lies to the south of this area. At the latter site there is a tendency for the early Owasco types to be horizontally separated from later Owasco pottery. Also, vessels with the largest capacity are from these sites.

One example is a large restored vessel from the middle Owasco stage of the Sackett Corded type (Fig. 110) . It was found by Walter Franke on Minisink Island. This outstanding specimen is now in the collections of the Seton Hall University Museum.

Sackett Corded, as defined by Lenig (1965: 6) , exerts a strong influence and is dominant from middle to late Owasco. It includes those types previously described by Ritchie and MacNeish (1949: 110-2) as Owasco Corded Horizontal, Owasco Herringbone, Owasco Platted, and Owasco Corded Oblique. For the Upper Delaware, Sackett Corded is radiocarbon dated to A.D. 1190 ± 100 years at the Miller Field site, which compares with the date, A.D. 1140 ± 150 years for the Sackett site in central New York. Eventually, the horizontal cord impressions of Sackett Corded give rise to the bold linear elements of Kelso Corded on low to medium-high, weakly defined collars (Lenig 1965: 6).

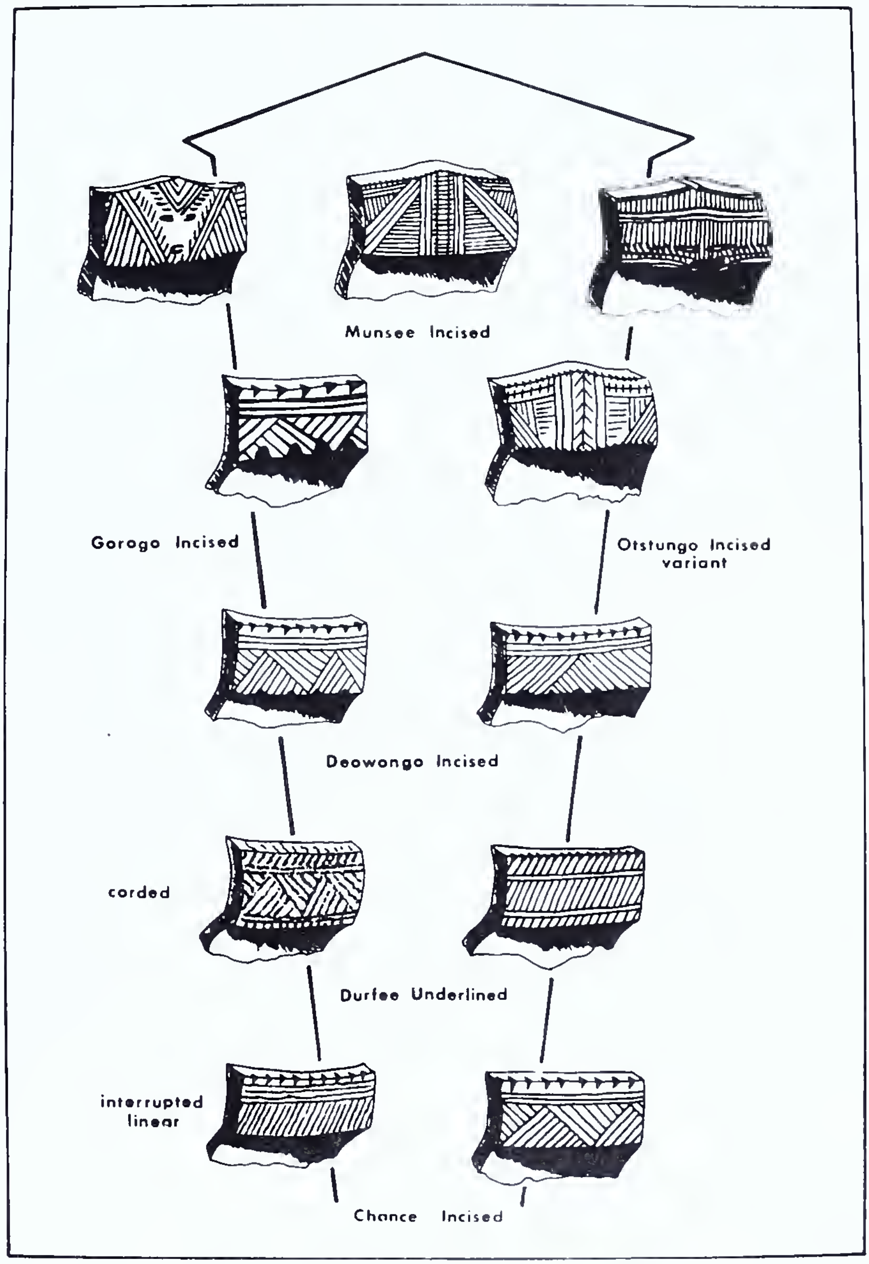


Fig. 111. TRIBAL SERIES CERAMIC TRENDS.

Kelso Corded is herein placed in terminal Owasco. Bainbridge Linear and Oak Hill Corded are transitional types (Fig. 109) between Owasco and Tribal, and they constitute the basis for the Oak Hill horizon (Lenig 1965). A date for a variant of Kelso Corded is A.D. 1310 ± 120 years at the Faucett site. A radiocarbon date for the Kelso site in central New York is A.D. 1390 ± 100 years, but Ritchie (1969a: 309) believes the true age to be closer to A.D. 1300. Kelso Corded is fairly common throughout the Upper Delaware Valley, and it is the local prototype for Oak Hill Corded. The latter is the execution of the Chance motif in a corded technique on a medium-high collar. Bainbridge Linear is executed in an interrupted style of incising on a low collar. Both Bainbridge Linear and Oak Hill Corded are interpreted as hesitant experimentation of style and technique of execution without abandonment of the old entirely nor complete adoption of the new. Bainbridge Linear is about as common as Kelso Corded, but Oak Hill Corded is relatively uncommon. A vessel executed in the Oak Hill technique with a Durfee Underlined motif is from a pit at the Faucett site that held charcoal that assayed at A.D. 1410 ± 100 years.

A majority of the Tribal pottery (Fig. 111) belongs to the Chance phase of the Mohawk tradition of eastern Iroquois. Overpeck Incised, Bowman's Brook Incised, Schultz Incised, and Lanorie Crossed sherds are occasionally present. Since these minority types are not part of the Mohawk sequence, they are considered as trade sherds. Chance Incised, Deowongo Incised, Durfee Underlined, and Garoga Incised are evenly distributed and fairly common throughout the Upper Delaware Valley. These types are regarded as participants in an evolving decorative motif which is based upon the increasing elaboration of the alternate triangular plats and oblique line motifs of Chance Incised. Faint notches or incised lines at the base of the collar determine Deowongo Incised, while bold notches determine Garoga Incised. Durfee Underlined is formed when a band of oblique or horizontally incised lines is applied to the base of the collar. Collar height increases with the correspondingly elaborate motifs. On some vessels an incised motif is present at the shoulder, and the decoration is a repetition of that on the collar. At the Kutay site, sherds of Deowongo Incised, Garoga Incised, and Durfee Underlined are from a pit containing charcoal that radiocarbon dated to A.D. 1400 ± 80 years. Otstungo Notched is frequently present as a minority type, and this corresponds to its behavior in eastern New York (Lenig 1965: 66-7).

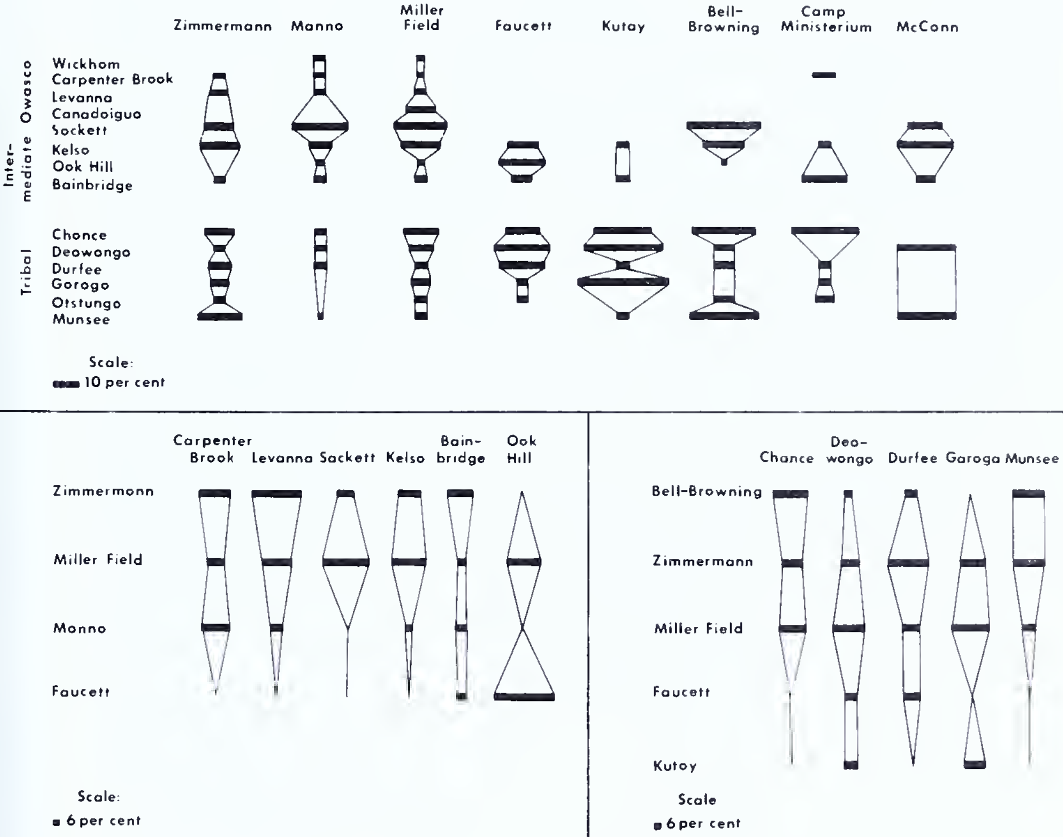


Fig. 112. SERIATION OF LATE WOODLAND CERAMIC TYPES.

Munsee Incised is the only incised pottery type to develop locally. Descriptions of the type have been previously published by Witthoft (1959a: 51-6) and Leslie (1968b: 134-8), while yet another description and discussion appears in the Appendix (pages 473-5). In brief, the type is believed to be part of a stylistic continuum that had its genesis with Chance Incised, and includes Deowongo, Garoga, Durfee, Kingston Incised, and other closely related eastern Iroquois types. Munsee Incised is distinctive and common throughout the area, but no site has yielded an abundance of this pottery. The type is not restricted to sites located on the flood plain. Munsee Incised was excavated by Schrabish (1930) at several rock shelters overlooking the Delaware River in Wayne and Pike counties, especially the Barnes Hill shelter near Callicoon and the Shohola Creek shelter. (This observation is based upon an annotated copy of the Schrabish volume, by John Witthoft, and a personal examination of the collections from the various shelters rather than Schrabish's ceramic typology.) However, large collections of Munsee pottery, from individual sites, are presently not available for purposes of comparison and seriation.

Certainly, there must be chronological development to Munsee Incised, but the lack of external evidence inhibits the elucidation of this. Numerous instances of European trade goods found in association with the pottery types are required before the direct historical approach can be used to solve this problem. Stylistically, it is not difficult to discern the increasing elaboration of the Munsee decorative motif. Horizontal bands are added to the collar, and notches frequently occur at the base of the collar. Zigzag patterns, short incised lines creating a ladder effect, stacked V's, and the subdivision of the triangular plats into complex triangular plats occur. Face effigies made by punctation and located at each of the castellations are common. As many as six or eight effigies are present on some vessels. Collar height increases and decoration on the shoulder is frequent.

Normally stylistic trends evolve from the simple to the complex. However, the increasing complexity of the decorative motif is not necessarily parallel to the chronological sequence. A deterioration of the potter's craft could mean that some of the simpler and ruder forms are chronologically late as a result of dependence upon European brass kettles.

Stone Tools (Fig. 113)

While Late Woodland ceramics are readily identified as to specific series, the products of the conservative stone tool industry are not easily separated by components. Although the details vary from site to site and locality to locality, the revealed stone tool assemblage is basic for all archeological manifestations throughout the Northeast. For the Upper Delaware Valley it is presumed that there are subtle age and cultural differences within the assemblages. Presently, minor and possibly diagnostic differences are unrecognized, but these should become clearer in the future.

Perhaps the several styles of netsinkers reflect cultural/chronological factors. The enigmatic notched and trimmed implements may be a diagnostic trait, but their significance and true function is presently unknown. *Pontillé*-decorated pipes are an example of a late trait, even though it is uncertain whether this technique is confined to the Historic period. Once the variations in form are better understood, triangular arrowpoints can probably be used as refined index markers.

Negative traits may be important. The low incidence of bone and antler tools and ornaments is curious in light of the relatively high yield of these items on Owasco-Iroquois sites in New York. It is unlikely that this can be attributed entirely to the acid soils of the Upper Delaware flood plain. These are a few examples of traits which may be instructive in refining the events of the Late Woodland period.

The following tabulation is a composite of the stone tools and the several other traits found associated with numerous Owasco and Tribal components in the Upper Delaware Valley:

Chipped Stone

- Projectile Points
  - Levanna
  - Madison
  - Generalized Triangular
  - Elongate Triangular
- Blanks
  - Triangular
  - Quarry
- Knives
  - Triangular
  - Ovate
  - Flake
- Scrapers
  - Triangular
  - Bulbar, Small and Thick
  - Notched
  - Generalized
- Drills
  - Triangular
- Perforators on Spalls
- Strike-a-lights
- Netsinkers
  - Notched Pebbles
  - Round Oval, Pecked
  - Notched and Trimmed Implements (use as netsinkers is questionable)
- Utilized Spalls and Flakes
- Bifaces
- Hoes
- Teshoas
- Saws
- Planes

Ground and Pecked

- Gorget, Drilled (?)
- Pestles
- Celts
- Bar Celts
- Adzes

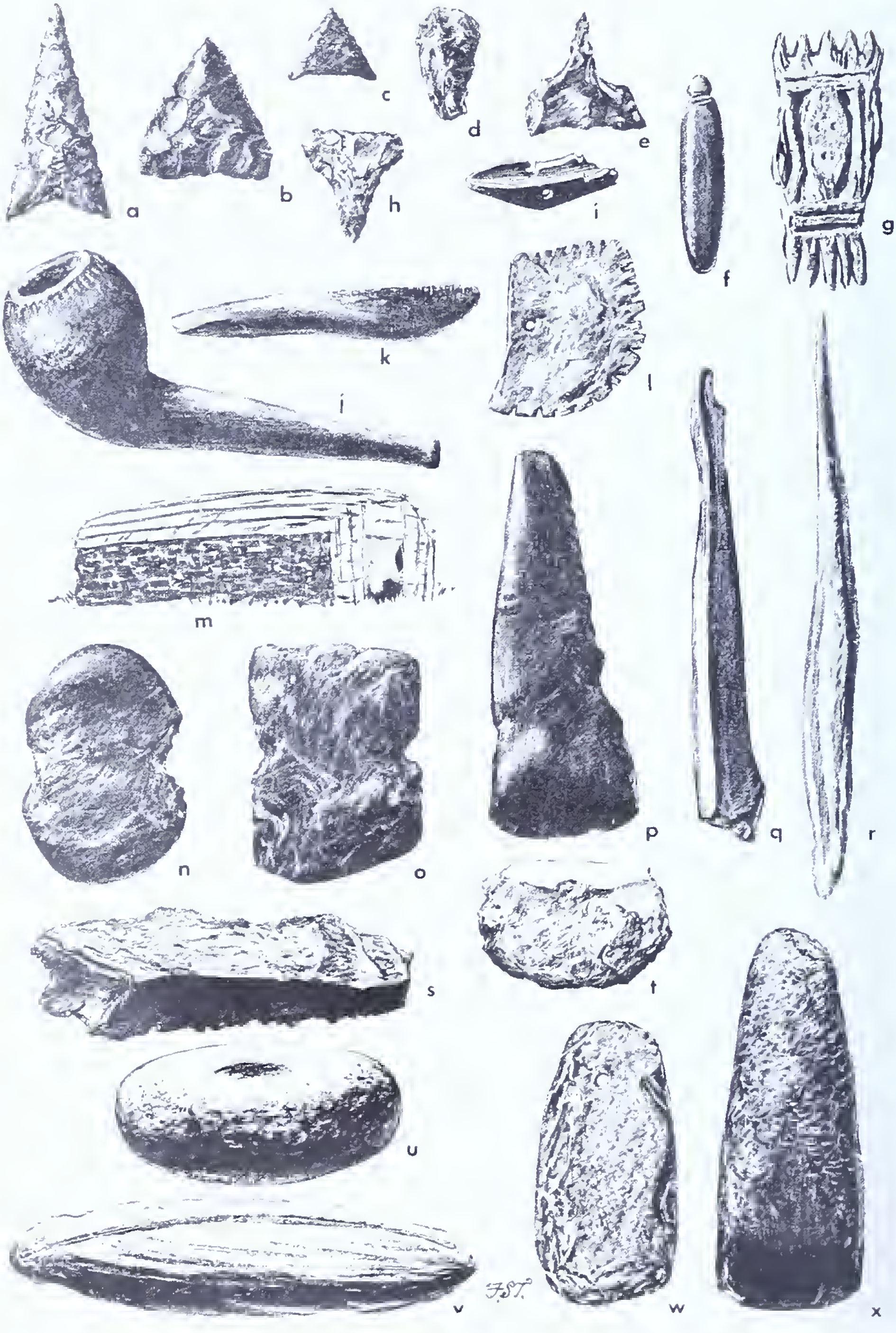


Fig. 113. OWASCO AND TRIBAL ARTIFACTS AND TRAITS: a, elongate triangular point; b, Levanna point; c, Madison point; d, small thick scraper; e, drill made from a triangular point; f, pendant; g, effigy antler comb; h, scraper made from a triangular point; i, possible awl sharpener or pendant (?); j, clay pipe; k, elongate pebble chisel; l, notched ornament; m, longhouse; n, notched netsinker; o, notched and trimmed implement; p, celt used as a whetstone; q, shell opener; r, bone awl; s, saw; t, teshoa; u, shaft polisher; v, pitted muller also used as a hammerstone; w, celt; x, pendant.

Altered by Usage

- Grinding Stones
- Mullers
  - Unpitted
  - Single and Multipitted
- Hammerstones
- Anvils
- Cupped Stones
- Shell Openers
- Abraded Stones
- Whetstones and Burnishing Stones
- Rounded Pebbles
- Shaft Polishers

Ornaments and Problematicals

- Pendants
- Engraved Stones (pattern stones)
- Phalloid Objects
- Shell Runtees

Other

Bone

- Awls
- Cup and Pin Game
- Tubular Bird Bone Beads

Antler

- Effigy Combs
- Flaking Tools

Turtle Shell

- Cups
- Rattles

Shell

- Beads

Ceramic

- Pipes
  - Effigy
  - Obtuse Angle
  - Trumpet
  - Ring Bowl
  - *Pointillé* Decorated
- Clay Beads
- Clay Spoon

Natural Objects, Collected

- Volcanic Tuff
- Quartz Crystal
- Red Ochre
- Fossils
- Caches of Potter's Clay

Subsistence

Hoe agriculture played the major role in the subsistence pattern during Owasco and Tribal development. Corn, beans, and squash were the principal crops which were supplemented by the collecting of various wild berries, fruits, and nuts. Hunting and fishing maintained an important position, but this importance varied as did the utilization of freshwater mollusks. The relative position of agriculture was not consistent. The inhabitants of the Kutay site showed a strong dependence upon agriculture and the gathering of mollusks, while hunting was a relatively minor activity. The bow and arrow, tipped with a triangular point, was employed for hunting game of all sizes. Although there is no evidence for traps, snares, or deadfalls, undoubtedly these devices were used to capture small game and birds. Fishing was primarily accomplished by netting, and probably weirs were also used. Fishing gear fashioned from bone has not survived. Vegetal and osseous material have a low incidence of survival. The following is a composite list of faunal remains:

Deer
Elk
Bear
Bobcat
Woodchuck
Gray Fox
Raccoon
Rabbit
Dog
Squirrel
Muskrat
Turtle
Turkey
Shad
Mackerel Shark
Freshwater Mollusks
Various Unidentified Species

Most of the cooking was done in basin-shaped hearths whose diameters ranged from about two feet to more than four feet. Usually hearths contained tightly packed fire-cracked river cobbles. At least one small hearth was surrounded by several postmolds, which suggests that a food drying or smoking rack was used in conjunction with the hearth (Fig. 102). A large bed of ashes, 15 feet across, at the Zimmermann site is presumed to have been used for drying fish and game.

Settlement Patterns and Chronology

None of the sites provided significant information relating to house types and village settlement patterns. There is insufficient data upon which to construct a site sequence similar to Mohawk (Lenig 1965), Seneca (Wray and Schoff 1953), or Susquehannock (Witthoft and Kinsey 1959). Nevertheless, a generalized postulated reconstruction of the events may have some validity.

Unfortunately, postmold patterns forming well-defined outlines of houses are absent at most sites. The Miller Field site provides unassailable evidence of house types. At that site, Kraft found one small longhouse which measured 20 feet by 60 feet. A second house was apparently remodeled from a circular house into a subrectangular structure with dimensions of 22 feet by 38 feet. A partly excavated third house of the same type was also identified. These structures had rounded ends and the entrance was on the long side. Partitions and silo-shaped pits were located inside the houses. Component affiliation is unknown, but the closest counterparts to these structures are at the Maxon-Derby and Bates sites of early-to-middle Owasco affiliation in central New York (Ritchie 1969a: 281-7).

Recent excavations by Kraft at the Harry's Farm site, revealed evidence of a house pattern (35 feet long by 22 feet wide) with rounded ends and the entrance on the long side. Deep storage pits containing Chance Incised and Durfee Underlined pottery types were found inside the pattern and in the surrounding area. Lee's Terrace is the only other local site with a possible longhouse, and it is presumed to be identified with a protohistoric Munsee component.

Circular houses are apparently present, although the postmold patterns are not completely convincing and the component identification is uncertain. A probable Owasco house with a diameter of 25 feet is reported for Brodhead-Heller while less definite round structures were found at Peters-Albrecht (36-Pi-21 and 36-Pi-22), McCann I, and Camp Miller sites. Interestingly, the postmold patterns at Peters-Albrecht (36-Pi-21) and Camp Miller have vestibule or windbreak attachments at the projected entrance.

Nowhere is there evidence to prove the presence of a palisaded village. While it is possible that some villages were enclosed by a stockade, defense evidently was not an important consideration. Most of the sites are situated at exposed locations on the flood plain, and little effort was made by the occupants to take advantage of natural features other than elevation. A group of large Owasco and Tribal sites are in the Milford-Minisink area, while a second group seems to be emerging in the area north of Tocks Island as a result of Kraft's work at the Miller Field and Harry's Farm sites. It may be that during the Late Woodland and Historic periods most of the population in the northern part of the reservoir was drawn to the Milford-Minisink area. Other Indians might have concentrated in this second area.

The Adrian van der Donck map of 1656 (Van der Donck 1841) includes the Delaware Valley, and it shows two Indian villages named t'Schichte Wacki located on the east bank in the Milford area. Farther north, on the west side of the Delaware in the vicinity of present-day

Port Jervis, Van der Donck places two villages named Mecharienkonck. The villages are not necessarily contemporaneous, since information for the map could have been collected by the author over a period of years from several different sources.

Van der Donck (1841: 196-8) in a discussion of the Indians of New Netherland (defined as extending from New England to Virginia), provides some useful observations without regard to tribal affiliation. He refers to castles, villages, and towns, and he implies that the castles and villages were permanent settlements with large populations. (My estimate is 1,500 to 2,500, based upon Van der Donck's data.) These are located on high ground and they are generally surrounded by a palisade. Towns represent smaller sites near water for spring and summer fishing and farming. Winter quarters were reputedly in forest situations protected from wind and where there was an ample supply of wood and game. While Van der Donck's account may not be completely dependable, there might be some validity to his observations. It could be that the Milford (Bell-Philhower site complex) and Port Jervis (Van Etten ?) area sites are the permanent settlements which Van der Donck termed villages and castles. Smaller sites may be hamlets, or his towns, to the larger villages. Sites such as McCann, Lee's Terrace, Peters-Albrecht (36-Pi-21 and 36-Pi-22), and others were perhaps inhabited by a lineage or an extended family because of the availability of tillable land and easy access to other natural resources. There is the suggestion that at least one site (Kutay) was occupied primarily for the cultivation of crops for a short passage of time. Rockshelters were also exploited as habitation sites, even if briefly, during Late Woodland and Munsee times. Nearly all sites were occupied intermittently. Abandonment of one site in favor of another location was probably determined by the depletion of soil nutrients and the absence of a suitable supply of wood.

Four radiocarbon dates provide a chronological framework for the local Late Woodland sequence.

Component	*Date*	*Association*	*Site*
Middle Owasco	A.D. 1190 ± 100	Sackett Corded	Miller Field
Intermediate (Oak Hill)			
Early Stage	A.D. 1310 ± 120	Kelso Corded	Faucett
Late Stage	A.D. 1410 ± 100	Oak Hill Corded (Chance motif)	Faucett
Tribal	A.D. 1400 ± 80	Deowongo Incised Garoga Incised Durfee Underlined	Kutay

Except for the Miller Field, most of the European trade goods are restricted to the major sites of the Milford-Minisink area (Bell-Philhower, Bell-Browning, Zimmermann, and Davenport). Possibly the Van Etten site near Port Jervis (Heye and Pepper 1915: 76) belongs to this group. Speculatively, it appears that the maturation to Historic Munsee occurred at several major sites in this area. If more burial sites were located and excavated, it is likely that the accompanying grave offerings would lend themselves to seriation, and this would make possible the construction of a Munsee chronology and site sequence. The Historic site sequence is probably confined to a relatively narrow area within the Upper Delaware Valley.

Based upon the trade goods such as pewter pipes, kaolin pipes, brass kettles, bracelets, hawk bells, etc., it appears that the Munsee cemetery (Heye and Pepper 1915) corresponds to the Seneca sites (Rochester Junction, Boughton Hill, Kirkwood, and Beal) of the A.D. 1675 to A.D. 1687 period (Wray and Schoff 1953: 59-60). These also compare, in quantity and type, with artifacts from the Strickler, the Oscar Leibhart, and the Bert Leibhart Susquehannock sites of A.D. 1650 to 1675 (Witthoft and Kinsey 1959). The florescence of native-made ornaments, effigies, runtees, tubular beads of shell, and antler effigy combs corresponds to a similar development in Seneca culture of this period. The tulip bowl pipe (Heye and Pepper 1915: Pl. XIIb) is a distinctive pipe style common to the late Susquehannock sites and is obviously a trade piece. Another similar trait is that the modes of burial are both extended and flexed. This is a characteristic of late Historic period sites under the influence of Christian missionaries. It is curious that Heye and Pepper found native pottery in the midden-filled pits, but not as burial offerings. This absence of a positive association of Munsee pottery with datable European trade goods retards the establishment of a Munsee chronology.

The Historic components at the Miller Field and Bell-Browning sites probably date from the middle of the seventeenth century. There are insufficient data to further refine this approximate chronology.

SUMMARY AND INTERPRETATIONS

The gross separation of the various Late Woodland components is based upon ceramic typology. The stone tool industry, settlement patterns, economic base, and other traits are not especially helpful in this respect. These traits are either too conservative, or too little is known about them, or they are of a generalized nature so that they are poor cultural and chronological indices. Archeological manifestations at most sites have yielded mixed cultural assemblages. Cultural trends of the Late Woodland and Historic periods can be described only in general terms because the details for these events are lacking.

Late Woodland witnesses the achievement of successful hoe agriculture and a slackening in the importance of hunting. Fishing, collecting freshwater mollusks, and the gathering of wild foods supplement the diet. During the Owasco stage the Indians of the Upper Delaware Valley participated in a contact sphere that included both down-river and coastal groups. The latter lived in the vicinity of present-day metropolitan New York and New Jersey. Items indicative of trade and travel include Milo Corded, Bowman's Brook Stamped pottery, and a mackerel shark's tooth.

In later times the contact sphere expands to include the Susquehanna Valley and western New York. Sherds of Proto-Susquehannock and the later Schultz Incised pottery are evidence for the former, while the presence of Lanorie Crossed and Niagara Collared pottery indicate connections with the latter area. Abbott Zoned (variant), Overpeck Incised, and Bowman's Brook Incised ceramics, and a salt water conch shell *(Busycon canaliculatum)* show continued coastal and down-river contact. The late (1650-1675) Susquehannock tulip bowl pipe form is a lower Susquehanna Valley and Lancaster and York counties type.

There is evidence that the Indians of the Upper Delaware shared two important traits, bear ceremonialism and sweat lodges, with their northern Algonquian neighbors. Other ceremonial practices, the use of masks in the False Face Ceremony, the ritual cleansing of the Big House Ceremony, and the Mid-Winter Festival are possible ceremonial practices. However, direct evidence is lacking.

The ceramic tradition is Owasco-Iroquois corresponding to the emergence of Mohawk in eastern New York. Ritchie (1949: 195) has suggested that for the Upper Delaware this tradition represents an upriver importation. This contention may be essentially correct, but it is possible that the Upper Delaware River valley and the tributary systems experienced a local *in situ* ceramic development. A case can be made to show that the local Owasco development parallels the New York sequence even to the extent of its divergence from late Point Peninsula ceramics. The full range of Owasco and eastern Iroquois pottery is clearly in evidence for the Upper Delaware Valley. There is no other competing indigenous ceramic tradition. Therefore, it is more likely that the Upper Delaware Valley and the environs should be regarded as a full participant in this tradition. It appears that the Late Woodland ceramic sequence for the Upper Delaware Valley is synchronous with similar events in central and eastern New York. The several radiocarbon dates do not suggest a time differential between the two areas, although differences could lie within the plus and minus factors.

The distinctively local late prehistoric development is the emergence of Munsee culture. Wallace (1949: 10-11) believes that the Munsee or Minsi were a sib division of the Delaware or Lenni Lenape Algonquian-speaking Indians. The other two divisions were Unami and Unalachtigo. The major village of the late seventeenth century is reported to have been in the Minisink area. The Bell-Philhower site complex is generally thought to be the location for a major Munsee occupation, although it is likely that a number of sites in that area were Munsee villages. A better understanding of the local archeology of the late Prehistoric and Historic periods is likely to reveal a Munsee sequence.

The postulation of Munsee origins is advanced because Munsee pottery is believed to be part of a stylistic continuum of Mohawk-Iroquois. There is no suggestion nor evidence that Munsee pottery is derived elsewhere and that it moved into the area. However, this interpretation presents a difficult linguistic-cultural problem. What was the language and what was Munsee culture? Barry Kent articulated the problem in a paper titled "Ceramics of the Early Historic Period on the Upper Delaware," which was read at the annual meeting of the Society for Pennsylvania Archaeology, Philadelphia, June 4 to 5, 1965. Leslie (1968b: 130) also touched upon the problem. In brief, there is the ambiguity of Iroquoian-speaking and Algonquian-speaking Indians possessing an identical ceramic tradition. This is not what we would expect, and it is regarded as an important and unresolved Late Woodland problem.

Our combined efforts have done little to contribute to a better understanding of Munsee archeology. We hope that concentration on this problem will resolve some of the confusion.

Table 12. Comparison of Culture Sequence and Chronology.

	UPPER DELAWARE VALLEY	EASTERN NEW YORK	WESTERN NEW YORK	NEW ENGLAND	OTHER
LATE WOODLAND	Tribal A.D. 1410 ± 100 (Y-2473) Faucett A.D. 1400 ± 80 (Y-2338) Kutay	Chance A.D. 1398 ± 150 Getman			
		Oak Hill A.D. 1450 ± 80 Nahrwold #1 A.D. 1337 ± 150 Oak Hill # 7	Oak Hill A.D. 1390 ± 100 Kelso A.D. 1380 ± 60 Howlett Hill A.D. 1370 ± 60 Furnace Brook A.D. 1300 ± 60 Furnace Brook		
	Late Owasco A.D. 1310 ± 120 (Y-2474) Faucett	Castle Creek A.D. 1310 ± 95 Nahrwold #1	Castle Creek A.D. 1290 ± 60 Chamberlain A.D. 1435 ± 200 Castle Creek A.D. 1196 ± 200 Castle Creek		
	Middle Owasco A.D. 1190 ± 100 (Y-2591) Miller Field	Canandaigua A.D. 1156 ± 200 Snell	Canandaigua A.D. 1160 ± 80 O'Neil 4 A.D. 1150 ± 80 O'Neil 4 A.D. 1298 ± 200 Bates A.D. 1190 ± 100 Bates A.D. 1125 ± 100 Bates A.D. 1130 ± 150 Sackett Carpenter Brook A.D. 1100 ± 100 Maxon-Derby A.D. 1100 ± 150 Maxon-Derby A.D. 1070 ± 60 Roundtop		

Table 12. Continued

	UPPER DELAWARE VALLEY	EASTERN NEW YORK	WESTERN NEW YORK	NEW ENGLAND	OTHER
MIDDLE WOODLAND	Kipp Island (?) A.D. 790 ± 120 (Y-2475) Faucett	Kipp Island (?) A.D. 700 ± 100 Tufano	Kipp Island A.D. 740 ± 100 Wickham 2 A.D. 630 ± 100 Kipp Island #3		
	Bushkill 480 B.C. ± 80 (Y-2590) Miller Field			Lagoon 100 B.C. ± 80 Vincent 360 B.C. ± 100 Peterson 430 B.C. ± 80 Pratt 520 B.C. ± 120 Pratt 590 B.C. ± 105 Peterson	
EARLY WOODLAND	Middlesex/Adena 610 B.C. ± 120 Rosenkrans				Adena 360 B.C. ± 200-A.D. 320 ± 400 (range of 9 dates from the Delmarva Peninsula)
	Meadowood 750 B.C. ± 100 (Y-2476) Faucett	Meadowood 760 B.C. ± 80 Nahrwood #2 841 B.C. ± 68 Hunter (Red Lake)	Meadowood 563 B.C. ± 250 Morrow 630 B.C. ± 100 Morrow 870 B.C. ± 60 Scaccia 998 B.C. ± 170 Oberlander #2		
ARCHAIC	Orient/Dry Brook 810 B.C. ± 100 (Y-2477) Faucett (Orient) 1170 B.C. ± 120 (Y-2339) Brodhead-Heller (Orient/Dry Brook) 1220 B.C. ± 120 (Y-2589) Miller Field (Orient) 1280 B.C. ± 120 (Y-2343) Zimmerman (Dry Brook)	Orient 763 B.C. ± 220 Jamesport 944 B.C. ± 250 Orient #2 944 B.C. ± 250 Stony Brook 2 974 B.C. ± 250 Stony Brook 2 1043 B.C. ± 300 Sugar Loaf Hill	Frost Island 1250 B.C. ± 100 O'Neil 2		

Table 12. Continued

	UPPER DELAWARE VALLEY	EASTERN NEW YORK	WESTERN NEW YORK	NEW ENGLAND	OTHER
ARCHAIC	Normanskill-like 1440 B.C. ± 100 (Y-2341) Brodhead-Heller	River 1339 B.C. ± 200 Bent 1930 B.C. ± 100 Bent 1760 B.C. ± 100 Pickle Hill	Normanskill-like 1940 B.C. ± 120 Farrell 2030 B.C. ± 160 Farrell		
	Perkiomen 1500 B.C. ± 120 (Y-2478) Faucett 1620 B.C. ± 100 (Y-2340) Brodhead-Heller 1640 B.C. ± 100 (Y-2588) Miller Field 1720 B.C. ± 120 (Y-2587) Miller Field			Watertown 1520 B.C. ± 125 Vincent 1670 B.C. ± 110 Litchfield	
	Susquehanna 1650 B.C. ± 80 (Y-2344) Zimmermann				
	Lehigh 1720 B.C. ± 100 (Y-1826) Peters-Albrecht (36-Pi-22)	Snook Kill 1470 B.C. ± 100 Snook Kill			Savannah River 1944 B.C. ± 250 Gaston
	Delaware Valley Archaic Complex 1710 B.C. ± 120 (Y-2342) Brodhead-Heller 3230 B.C. ± 200 (Y-2479) Faucett	Sylvan Lake 2210 B.C. ± 140 Sylvan Lake 3 Vosburg 2524 B.C. ± 300 Bannerman 2780 B.C. ± 80 Sylvan Lake 2 Vergennes 4610 B.C. ± 100 Sylvan Lake 1	Brewerton 2010 B.C. ± 100 O'Neil 1 2050 B.C. ± 200 O'Neil 1	Squibnocket 2070 B.C. ± 115 Peterson 2190 B.C. ± 100 Hornblower 2 Brewerton 2270 B.C. ± 160 Hornblower 2	Brewerton 2350 B.C. ± 180 Sheep Rock

ADDENDUM

Subsequent to the completion and the submission of this manuscript to the Pennsylvania Historical and Museum Commission for publication in March, 1970, additional excavations at the Faucett site were carried out during the summer of that year. This research was the subject of a preliminary paper read by Kinsey at the meeting of the Eastern States Archeological Federation in Natural Bridge, Virginia, November, 1970 ("Faucett Site: Chronology and Settlement and its Relationship to the Archaeology of the Northeast," Eastern States Archeological Federation, *Bulletin* 30, Trenton, N. J.).

The continued investigation (16,000 additional square feet of horizontal excavation and 216 additional six-inch levels) of the Faucett site strengthened our firm conviction regarding the importance of this deeply stratified site in delineating cultural progression in the Upper Delaware Valley. While the new data did much to elaborate upon and support the earlier findings, a few previously held views were slightly modified. More important in this investigation is the excavation and recognition of three Late Archaic occupations: a substantial Lackawaxen component, a Vosburg component, and an unidentified component. These manifestations were in the appropriate position in the stratigraphic sequence, and their chronological status is supported by radiocarbon dates.

Evidence for more intensive occupations of the Tribal (including two house patterns), Owasco, Bushkill, Meadowood, and Orient components was also revealed. Further traces of the Perkiomen occupation were not found within any of the newly and deeply excavated squares. It is clear that this component is contained within a small locus.

Summary of Cultural Components and Radiocarbon Dates at the Faucett Site

Component	*Depth and/or Feature*	*Radiocarbon Dates*	
		1968	*1970*
Tribal	Fea. 52	A.D. 1410 ± 100 (Y-2473)	
Owasco	Fea. 117	A.D. 1310 ± 120 (Y-2474)	
Kipp Island (?)	12 inches below datum	A.D. 790 ± 120 (Y-2475)	
Bushkill	Fea. 68, 12 inches below datum		100 B.C. ± 135 (I-5542)
Bushkill	Fea. 161, 18 to 24 inches below datum		400 B.C. ± 95 (I-5233)
Meadowood	30 inches below datum	750 B.C. ± 100 (Y-2476)	
Orient	Fea. 89, 18 to 24 inches below datum	810 B.C. ± 100 (Y-2477)	
Perkiomen	Fea. 99, 57 inches below datum	1500 B.C. ± 100 (Y-2478)	
Lackawaxen	Fea. 171, 69 to 73 inches below datum		2180 B.C. ± 180 (I-5236)
Lackawaxen	Fea. 181, 67 to 72 inches below datum		2495 B.C. ± 130 (I-5411)
Lackawaxen	Fea. 165, 60 to 66 inches below datum		2610 B.C. ± 110 (I-5234)
Brewerton, Eared Notched	72 to 78 inches below datum	3230 B.C. ± 200 (Y-2479)	
Vosburg	Fea. 158, 78 to 84 inches below datum		3620 B.C. ± 200 (I-5237)
Unknown	Fea. 188, 96 to 102 inches below datum		4220 B.C. ± 135 (I-5238)

A full report on this continued investigation of the Faucett site will be the subject of a future report.

W. Fred Kinsey, III
February, 1971

Appendix

Most of the pottery and projectile point types referred to in the texts of the site reports have been previously described. It seems useful, however, to include descriptions of the diagnostic features for those types since they are frequently referred to in the site reports. These descriptions provide guides for the understanding of the types, they assist in delineating the variety of types, and they express the range of variation within relatively narrow geographic boundaries. Since the area is to be flooded, it is desirable to bring into focus some of these local diagnostic traits, their distribution, and their context before inundation occurs. The inclusion of descriptions in an appendix avoids repetition in the site reports.

Fortunately, for the analysis of the projectile points, there is available a large surface collection from the general Bushkill area. This collection of 1,977 projectile points was graciously donated to the North Museum of Franklin and Marshall College by Havard Macpherson, Bushkill, Pennsylvania, and Tucson, Arizona, who personally collected much of it during the 1930's. He enlarged this collected through the purchase of selected items from certain local collections. Estimates of the number of site locations for the projectile point types are based upon the Macpherson catalog. Other site data were added when it seemed pertinent. For the most part, the Macpherson Collection reflects collecting activities on the Pennsylvania side between Shawnee-on-Delaware and Dingmans Ferry. This is roughly one-quarter of the area under consideration. In some instances actual site locations are known, while in other cases only the general locality is known. The collection is large enough to be considered representative for the area.

The Macpherson Collection has undergone close scrutiny. A former Franklin and Marshall student, Roger Moeller, analyzed the collection for a research paper in a tutorial course, and the collection later was studied by another student, Jeffrey Graybill, and by Kinsey. Descriptions were prepared and some were circulated to a number of individuals for comment. Where possible, measurements were made on 10 specimens in each type group. Measurements are given in inches and hundredths of an inch. Those selected for measurement express the range for the type and are intact or nearly intact. Illustrated specimens represent the suggested type range rather than a compact group of look-alikes.

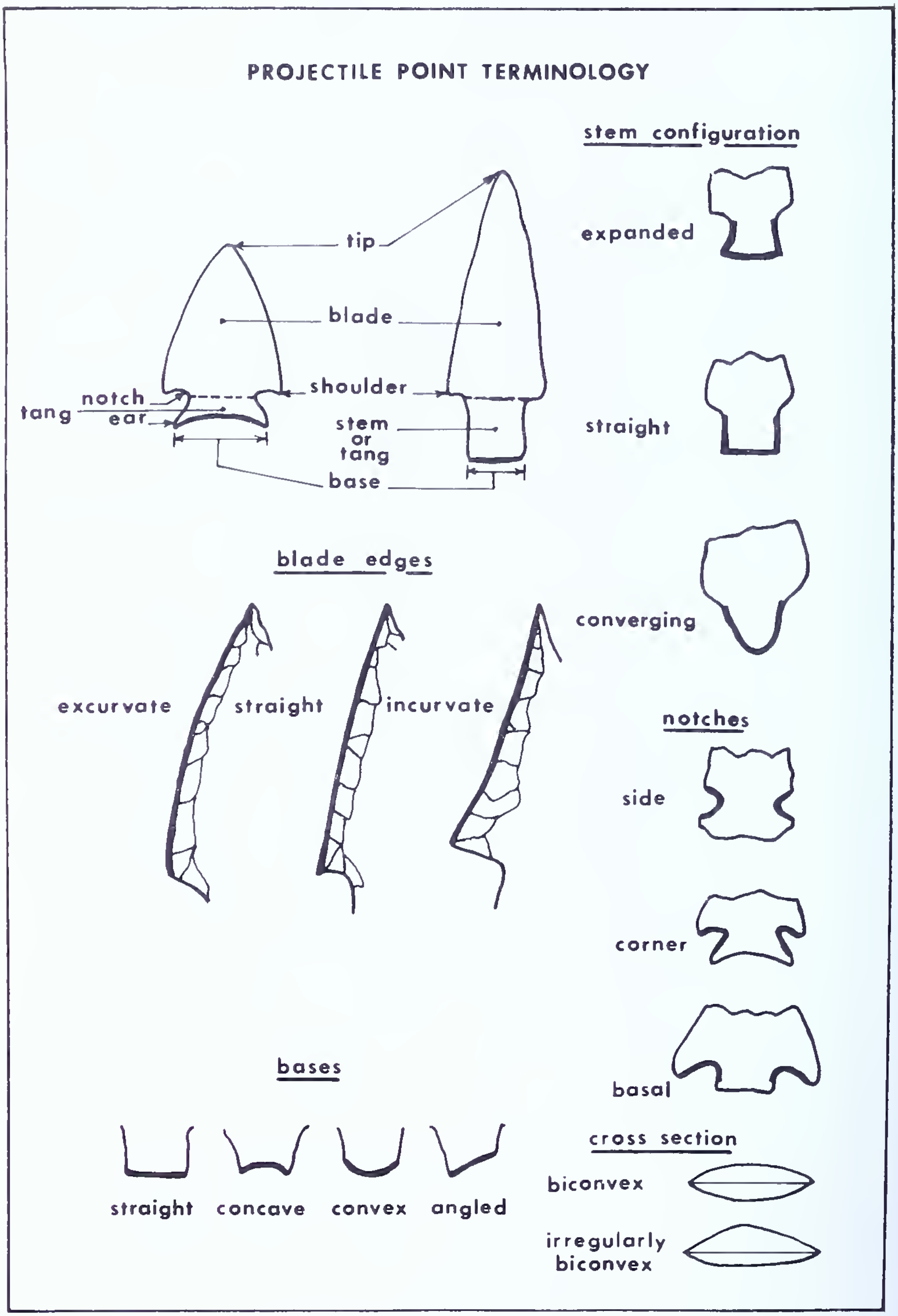


Fig. 114. PROJECTILE POINT TERMINOLOGY.

Descriptions of Dry Brook and Susquehanna types are based upon excavated specimens from the Zimmermann site. Werner prepared the description of the Dry Brook type on the basis of Zimmermann site data and a study of local collections. The Lehigh/Koens-Crispin data were prepared with Kraft, and the excavated examples of the Koens-Crispin form from the Miller Field site were utilized for comparative purposes. Werner, Kraft, and Marchiando provided helpful additional information, context, and distributional data for many of the projectile point and pottery types.

A study of projectile points for the northern portion of the Delaware Valley in Wayne County, Pennsylvania, and Sullivan County, New York, was carried out by Leslie (1963c). Leslie observed the following types which correspond to those described in this appendix:

Vosburg
Brewerton Side-Notched
Brewerton Corner-Notched
Brewerton Eared-Triangular
Brewerton Eared-Notched
Otter Creek
Normanskill
Lamoka
Bifurcate-Stemmed
Lehigh
Perkiomen
Susquehanna
Orient
Rossville
Jack's Reef Corner-Notched
Jack's Reef Pentagonal
Levanna
Madison

Lithic Terminology

Chert: A fine-grained siliceous rock, mostly of impure cryptocrystalline quartz stained a variety of colors. As used here, the term is confined to the lighter colors: brown, blue, and gray to off-white. The colors are usually mixed in a mottled or marbleized pattern. In thin sections and along edges it is slightly translucent.

Flint: The darker cherts, ranging to black. Several varieties occur in local outcrops.

Jasper: An opaque, uncrystalline quartz, hard and fine-grained. It is brown and red, and when heated it becomes dark red. Local river cobbles and quarries in Berks County are the sources for this material.

Chalcedony: A cryptocrystalline quartz with crystals too fine to be visible. Color is commonly light gray, but may be any color owing to impurities. Locally the colors range toward the darker side—to blue, and even black.

Shale: A moderately fine-grained sedimentary rock with bedding planes and rich in clay particles. Inclusions of organic matter account for some darker colors. It weathers to a chalky gray-white. Shale banks are common in the area.

ARGILLITE: A metamorphosed shale. It lacks bedding planes and breaks into angular or blocky fragments. Unweathered it is gray-black and weathered it is gray-purple.

ARGILLACEOUS SHALE: An intergrade less metamorphosed than argillite.

SANDSTONE: A sedimentary rock of cemented quartz grains.

SILTSTONE: Somewhat similar to sandstone, but with particle size ranging between that of sandstone and shale.

Note: These are only visual descriptive terms; they are not the result of geological analysis.

PROJECTILE POINT TYPES

LAURENTIAN TRADITION

Vosburg (Fig. 115 A)

Description: These are well-made, small to medium-sized corner-notched points. They are thin and mildly biconvex and at least half as broad as they are long. The width of shorter examples may be as much as two-thirds that of the length. Blade edges are excurvate. Sixty-nine per cent of the bases are concave and 31 per cent are straight. A majority have an expanded base with sharp ears, and on a minority the base is expanded beyond the shoulders. Shoulder angles range from acute through right angle to obtuse, with the former more common. A majority show basal grinding.

Lithic preference: flint 54.8 per cent (46), chert 11.9 per cent (10), argillaceous shale 7.2 per cent (6), quartzite 5.9 per cent (5), argillite 5.9 per cent (5), chalcedony (4), jasper (4), shale (3), and quartz (1). Local black flints are the preferred lithic material. Total sample size: 84.

	Length (inches)	*Width*	*Thickness*
Range	2.21-1.12	1.17-.85	.26-.17
Average	1.64	.99	.23

(based upon 10 specimens)

Comments: This type is found largely in eastern New York (Ritchie 1961: 55). Funk (1965: 153) found this type at a number of sites throughout the Hudson Valley, and there are two radiocarbon dates, 2780 B.C. ± 80 years and 2524 B.C. ± 300 years. Vosburg points are also found in Massachusetts (Rose 1965: 36; Fig. 4, Nos. 5, 6) and Ohio (Prufer and Sofsky 1965: 32).

In the Upper Delaware Valley, Vosburg points are fairly common. Good examples of the type have been found on the surface of 30 to

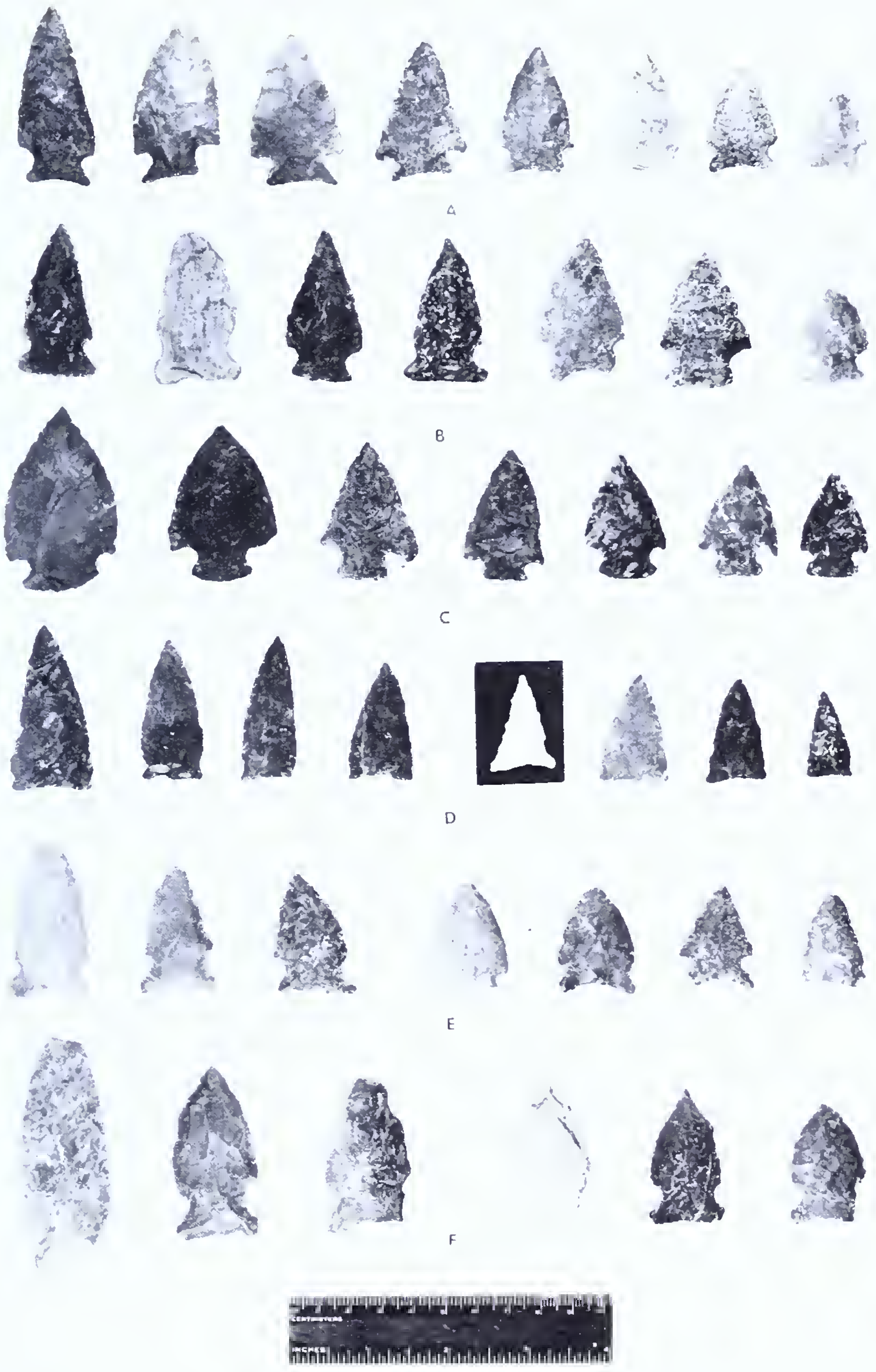


Fig. 115. LAURENTIAN PROJECTILE POINT TYPES: A, Vosburg points; B, Brewerton Side-notched points; C, Brewerton Corner-notched points; D, Brewerton Eared Triangular points; E, Brewerton Eared-Notched points; F, Otter Creek points.

40 sites, including three examples from the Macpherson hilltop site. The type is one of the major Archaic forms at the Zierdt site.

Brewerton Side-Notched (Fig. 115 B)

Description: These are generally short and broad side-notched points. Large examples are about twice as long as they are wide, while shorter specimens are proportionately broader with the width never equal to or greater than the length. A majority of the edges are mildly excurvate with a few examples having a straight edge. Usually the greatest width occurs at the shoulder, but in some instances the base is expanded beyond the shoulder width. Forty per cent of the bases are convex, 25.0 per cent concave, and 7.0 per cent indeterminate. Basal grinding is present on about 65.0 per cent of the specimens. Shoulder form varies from an acute angle to rounded and sloping, with the former in the minority. Notches are well-formed and generally of medium size, and they are frequently ground smooth.

Lithic preference: flint 73.7 per cent (42), chert 8.6 per cent (5), argillaceous shale (4), chalcedony (3), quartzite (2), shale (1). Local flints are the preferred lithic material. Total sample size: 57.

	Length (inches)	*Width*	*Thickness*
Range	1.90-1.22	1.30-.65	.37-.22
Average	1.56	.96	.29

(based upon 10 specimens)

Comments: This type is widely distributed throughout the Northeast, especially New York. It is found in New England, southern Ontario, the Appalachians in western Pennsylvania and West Virginia, and central Pennsylvania, and in New Jersey (Ritchie 1961: 19). The presence of the Laurentian tradition in the upper Ohio Valley, as expressed by small side-notched and corner-notched projectile points, has been discussed in detail by Dragoo (1959). Dragoo now considers a radiocarbon date of 3360 B.C. ± 90 years (Dragoo 1959: 238) for the deeper levels of the Rohr shelter to be a valid date for the Late Archaic Laurentian in the Ohio Valley. Brewerton Side-Notched points have been identified for that area by Prufer and Sofsky (1965: 25). In the lower Delaware the type is found at the Abbott Farm site (Cross 1956: Pl. 20b). In New York Brewerton Side-Notched points are considered the oldest type of the Brewerton phase. Five radiocarbon dates from Frontenac Island and the O'Neil site provide a time span from 2980 B.C. to 1723 B.C., and Ritchie (1965a: 91) feels that this phase reaches a climax about 2000 B.C. At the Sheep Rock shelter, in central

Pennsylvania, Brewerton Side-Notched points are found only in Level 5 and this stratum is radiocarbon dated 2350 B.C. ± 180 years (Michels and Smith 1967: 578, 863).

In the Upper Delaware this type is fairly common. It is found on the surface of at least 15 to 20 sites, including the Macpherson hilltop site. Examples have been excavated in an Archaic context mixed with other Brewerton types, as well as Vosburg, Lackawaxen, Egypt Mills, Lamoka-like, Normanskill-like points, and other Archaic types. This situation occurs at the Zierdt site, at the Egypt Mills site, and in the basal deposit at the Schneider site.

Brewerton Corner-Notched (Fig. 115 C)

Description: These are generally short, broad, corner-notched points. Length and width proportions are similar to Brewerton Side-Notched. Blade edges range from excurvate, to mildly excurvate, to straight, with mildly excurvate the most common form. Sixty and one-half per cent of the bases are straight, 27.0 per cent mildly convex, 10.2 per cent concave, and 2.3 per cent indeterminate. Bases are expanded and two-thirds of the specimens have basal grinding. Notches are small to medium. Shoulders with sharp and acute angles occur on more than half.

Lithic preference: flint 66.7 per cent (32), chert 18.8 per cent (9), argillaceous shale (4), chalcedony (2), and jasper (1). Local black flints are the preferred lithic material. Total sample size: 48.

	Length (inches)	*Width*	*Thickness*
Range	2.00-1.25	1.35-.85	.31-.22
Average	1.58	1.02	.26

(based upon 10 specimens)

Comments: Although this is primarily a central and western New York type, examples are found in eastern New York (Ritchie 1961: 16). Similar Laurentian corner-notched points have been discussed for the Ohio Valley by Dragoo (1959), and the type has been reported for that area by Prufer and Sofsky (1965: 25-7). These are considered a minority type of the Brewerton phase, and the expected age range is similar to that attributed to Brewerton Side-Notched (Ritchie 1965a: 93).

In the Upper Delaware the type is common, and it is found on the surface of at least 20 to 30 sites. Five examples are from the Macpherson hilltop site, and it is a minority type at the Zierdt and Schneider sites.

Brewerton Eared-Triangular (Fig. 115 D)

Description: These are small, thin, isosceles triangular points with small, shallow notches. Blade edges on all specimens are mildly excurvate. Slightly concave bases occur on 68.0 per cent of the examples of this type while the bases on the remainder are straight. Notches are very faint and even delicate. Sharp and small ears are frequently present. Basal grinding occurs on a majority.

Lithic preference: flint 64.0 per cent (16), argillaceous shale 28.0 per cent (7), and quartz (1). Local black flints are the preferred lithic material. Total sample size: 24.

	Length (inches)	*Width*	*Thickness*
Range	2.60-.97	1.03-.62	.25-.15
Average	1.48	.78	.20

(based upon 10 specimens)

Comments: This is a minority type of the Brewerton phase which is more prevalent in central and eastern New York and southern New England (Ritchie 1961: 18). It is also found in northeastern Pennsylvania and New Jersey. The Oak Island site in Massachusetts yielded examples of the type (Scothorne 1968: 44, Fig. 4, Nos. 29-32). The presence of the type has been noted in Ohio (Prufer and Sofsky 1965: 27). The age range is probably similar to the Brewerton Side-Notched type (Ritchie 1965a: 93).

In the Upper Delaware Valley the type is not abundant, but it has been found on the surface of at least 10 to 14 sites, including two specimens found at the Macpherson hilltop site.

Brewerton Eared-Notched (Fig. 115 E)

Description: These are small to medium-sized points with side notches and prominent ears. The blade is excurvate and the notches are small. The base is concave and ground smooth on all examples. About half have sharp ears and they are rounded on the remaining specimens. The shoulder angle tends to be obtuse.

Lithic preference: flint 50.0 per cent (5), chert (2), jasper (1), shale (1), and argillite (1). Local flint is the preferred lithic material. Total sample size: 10.

	Length (inches)	*Width*	*Thickness*
Range	2.17-1.15	1.16-.75	.36-.19
Average	1.53	.92	.25

(based upon 10 specimens)

Comments: This is a minority type of the Brewerton phase found more commonly in central and eastern New York and southern New England (Ritchie 1961: 17; 1965a: 93). In Massachusetts the presence of this type is noted at the Boats site (Rose 1965: 37, Fig. 5, Nos. 9-13) as well as other sites. Prufer and Sofsky record the type for the McKibben site in Ohio (1965: 27).

For the lower Delaware Valley, Cross (1956: Pl. 20b) illustrates the type. Points of this type from the Macpherson Collection have been found on about six or seven sites. At the Faucett site an argillite specimen of the type was excavated from a deep stratified section at 79 inches below datum. Its position was below three other Archaic components. Charcoal collected from the same square and level yielded a radiocarbon date of 3230 B.C. ± 200 years. One example was excavated from the Brodhead-Heller site in a mixed Archaic context in Level IV which is radiocarbon dated to 1710 B.C. ± 120 years.

Otter Creek (Fig. 115 F)

Description: This is a medium to large, rather thick, and roughly made side-notched point. Blade edges are excurvate and the base is expanded with prominent tangs. Ears are rounded to squarish. Shoulders are acute to rounded. Bases are concave on all except one specimen. Basal grinding is present on 9 examples.

Lithic preference: flint 60.0 per cent (6), shale (3), and chert (1). Local flint is the preferred lithic material. Total sample size: 10.

	Length (inches)	*Width*	*Thickness*
Range	2.20-1.52	1.10-.80	.40-.23
Average	1.92	1.03	.31

(based upon 4 specimens)

Comments: In the Northeast the type is found in the Otter Creek Valley in Vermont and is occasionally found on Brewerton sites in central New York (Ritchie 1961: 40). In eastern New York, Otter Creek-like points were found at the Sylvan Lake site. They were above and below a level radiocarbon dated 4610 B.C. ± 100 years (Funk 1965: 145), while at Martha's Vineyard in Massachusetts the type was found at the Hornblower II site in Stratum 4 with Brewerton types radiocarbon dated 2270 B.C. ± 160 years (Ritchie 1965b: 136; 1969: 52).

The type and similar related forms are widely distributed in the eastern United States and are recognized by other names. In Ohio they are termed Newton Falls Side-Notched (Prufer and Sofsky 1965: 23-5), in Tennessee and the middle South they are recognized as Big

Sandy (Cambron and Hulse 1964: A-11, after Kneberg), and in Wisconsin they are termed Osceola (Bell 1958: 68-9) and also Raddatz.

In the Upper Delaware the type is not common, but it is found on 8 to 10 sites including the Macpherson hilltop site. At the Zierdt site it is a minority type.

PIEDMONT TRADITION—DELAWARE VALLEY ARCHAIC COMPLEX

Lackawaxen Stemmed (Fig. 116 A-C)

Description: This is a broad category of long, narrow-blade, stemmed points. Three subtypes are recognized: Expanded Stem, Straight Stem, and Converging Stem. Intergrades are present among the several subtypes. These points are about two and one-half to three times as long as they are wide, with a length range of 3.86 to 1.37 inches. Average length is slightly less than 2.50 inches and average width is about .80 inches. In cross section they are biconvex and irregularly biconvex. Because of the weathered condition of most of the lithic material, it is usually not possible to determine if basal smoothing is present, but a few specimens show definite signs of this trait.

Shale, argillite, and argillaceous shale are diagnostic lithic materials for this type. Total sample size: 221.

Subtype 1—Expanded Stem, 41.3 Per Cent (Fig. 116 B)

Blade edges are straight on more than half and mildly excurvate on the others. In some instances opposing blade edges are not symmetrical. One edge may be excurvate while the opposite edge is straight. A number have irregular edges which are probably worn and reshaped from use as knives. Shoulders are rounded and slope toward the stem. Stems are slightly expanded. Sixty-six per cent of the bases are convex, 26.0 per cent straight, 6.2 per cent concave, and 2.1 per cent indeterminate. About 27.0 per cent have an unretouched base.

Lithic preference: argillaceous shale 69.0 per cent (67), shale 15.5 per cent (15), and argillite 15.5 per cent (15). Local argillaceous shale is the preferred lithic material. Total sample size: 97.

	Length (inches)	*Width*	*Thickness*
Range	3.07-1.73	.89-.40	.33-.17
Average	2.26	.74	.28

(based upon 10 specimens)

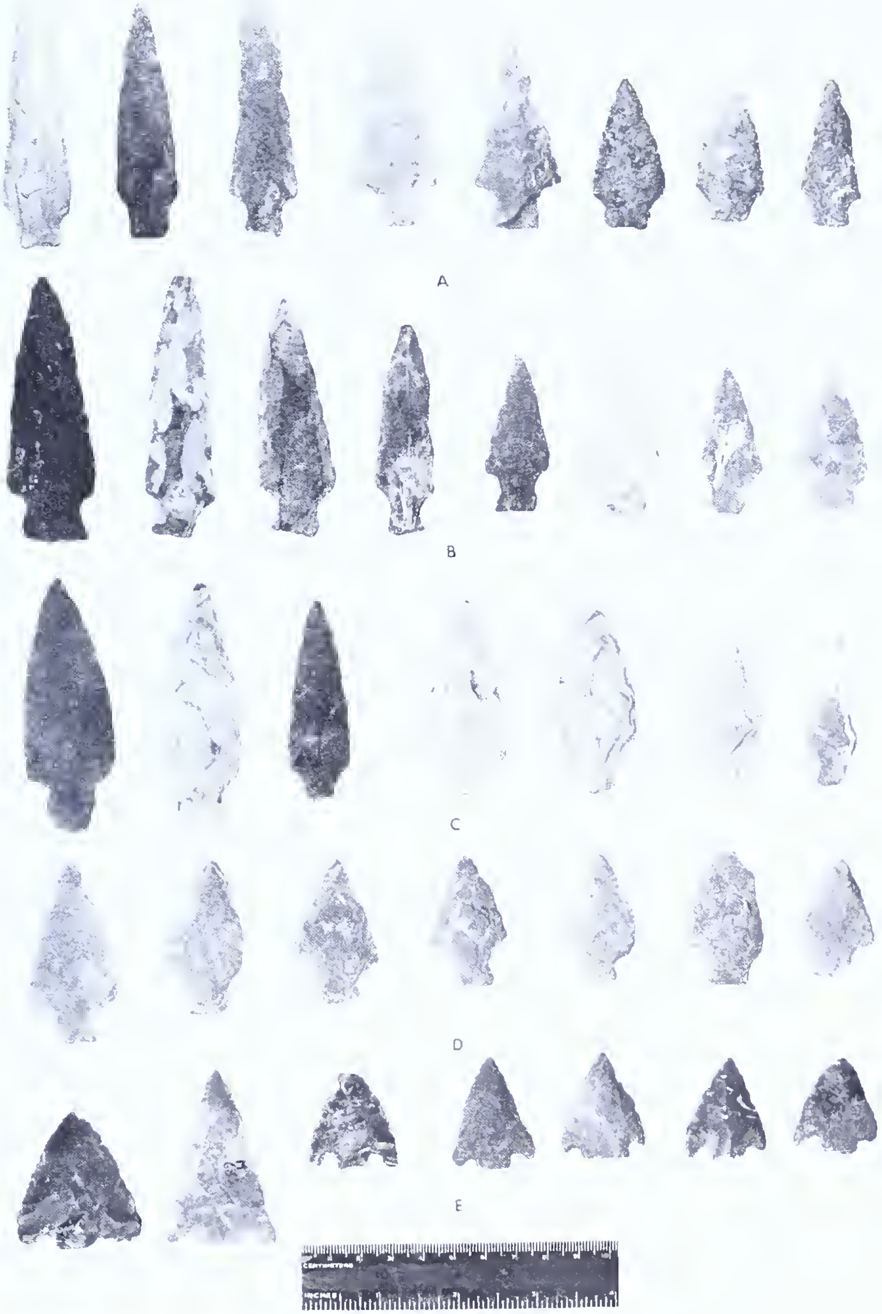


Fig. 116. DELAWARE VALLEY ARCHAIC COMPLEX PROJECTILE POINT types and the Eshback point: A, Lackawaxen Straight Stem points; B, Lackawaxen Expanded Stem points; C, Lackawaxen Converging Stem points; D, Egypt Mills points; E, Eshback points.

Subtype 2—Straight Stem 38.7 Per Cent (Fig. 116 A)

Blade edges are mildly excurvate and rarely straight. Shoulders range from rounded and sloping to straight and sharply barbed, with the former in the majority. Shoulders on this subtype are more prominent than those on the other two groups. Forty and seven-tenths per cent of the bases are straight, 39.6 per cent convex, 13.2 per cent concave, and 6.6 per cent indeterminate. Unretouched or partly unretouched bases occur on 16.5 per cent and all specimens exhibiting this characteristic have a straight or mildly angled base.

Lithic preference: argillaceous shale 40.7 per cent (37), flint 39.6 per cent (36), shale 6.6 per cent (6), chert 5.5 per cent (5), argillite (3), siltstone (3), and jasper (1). Local argillaceous shales and flints are the preferred lithic material. Total sample size: 91.

	Length (inches)	*Width*	*Thickness*
Range	3.56-.1.37	1.00-.75	.40-.25
Average	2.43	.87	.33

(based upon 10 specimens)

Subtype 3—Converging Stem 20.0 Per Cent (Fig. 116 C)

Blade edges are straight on slightly less than half and the others are mildly excurvate. Approximately 50.0 per cent have irregular edges, apparently from use as knives and from reshaping. Shoulders are rounded and stems are convergent. Bases are straight to slightly convex, with 41.3 per cent of the bases unretouched.

Lithic preference: shale 53.0 per cent (25), argillaceous shale 21.5 per cent (10), flint 17.0 per cent (8), argillite (3), and siltstone (1). Local shales and argillaceous shales are the preferred lithic material. Total sample size: 47.

	Length (inches)	*Width*	*Thickness*
Range	3.12-1.80	1.02-.73	.37-.20
Average	2.48	.87	.29

(based upon 10 specimens)

Comments: Leslie (1967a: 111-4) has named and described this distinctive type. The Lackawaxen stemmed point is common to the Upper and middle Delaware Valley and the Lackawaxen Valley in Pennsylvania, the Passaic Valley in northern New Jersey, and the Wallkill Valley in New York and New Jersey. Some examples are also found south of the Water Gap in the lower Delaware Valley. In Massachusetts the corner-removed form resembles the Converging Stem subtype (Robbins 1959: 43; Scothorne 1968: 42, Fig. 2, Nos. 1-12; Fowler 1968a: 20, Fig. 2, Nos. 1-14).

In the Upper Delaware Valley the Lackawaxen Stemmed point is the dominant type of the Lackawaxen phase of the Delaware Valley Archaic complex. Apparently there is some carry-over of related forms into the Early Woodland. The type is found on at least 25 to 30 sites including the Macpherson hilltop site. The type occurred at the Zierdt site above the Laurentian types and at the Zimmermann site with Susquehanna broadspears. The type was found in association with hammerstones, anvils, celts, choppers, knives, spearthrower weights, a mortar, grinding stones, and other items at the Herring 1 site (Werner 1968). Lackawaxen stemmed points were found in the middle levels (Archaic) of the Schneider site. The three subtypes are usually found together as surface manifestations.

A late terminal date of 1710 B.C. ± 120 years from the Brodhead-Heller site is felt to date the Expanded Stem subtype. Although a diagnostic Lackawaxen point was not found, the preference for argillite and argillaceous shale is noted for the deepest levels of the Faucett site. A radiocarbon date of 3230 B.C. ± 200 years suggests a long span for this shale lithic tradition. (See page 396 for three radiocarbon dates for the Lackawaxen phase at the Faucett site.) Chronology at the Egypt Mills site implies that the Straight Stem points are the youngest, followed by the Expanded Stem points, and finally the Converging Stem. The latter is the oldest and there is a temporal overlap between the Laurentian types and the Lackawaxen Stemmed type. Barry Kent, William Penn Memorial Museum, has informed the writer of an excavation that he conducted on Piney Island in the lower Susquehanna Valley which suggests an age priority for somewhat similar long, narrow-bladed, expanded-stem points made of quartz and quartzite.

Macpherson (new type) (Fig. 117 A)

Description: These are rather roughly made, medium to long, and proportionately narrow blade points with wide side notches. The overall appearance is one of asymmetry, much of it probably caused by reworking. In cross section they tend to be biconvex, although about half are asymmetrically biconvex. Nearly 50.0 per cent have a high ridge in longitudinal cross section on at least one side. Blade edges are mildly convex and shoulders tend to be rounded, with only a few having sharp shoulders. Side notches are broad and shallow on about 70.0 per cent, with those on the remaining examples deeper and more distinct. Bases are convex on nearly all examples. A minority have either an angled or an unretouched base. The rounded base is a distinctive feature of this point type.

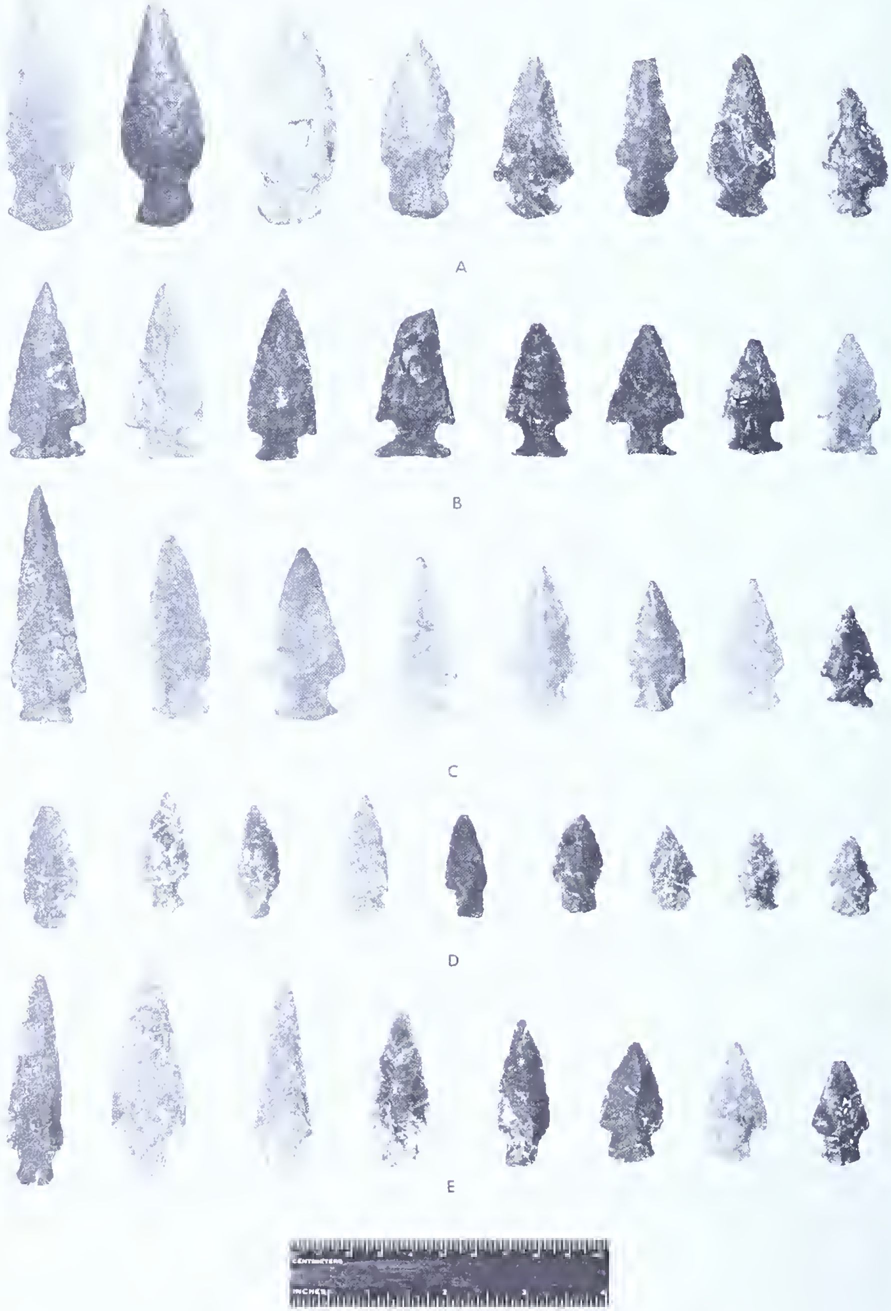


Fig. 117. MACPHERSON, NORMANSKILL, NORMANSKILL-LIKE, Lamoka, and Lamoka-like projectile point types: A, Macpherson points; B, Normanskill points; C, Normanskill-like points; D, Lamoka points; E, Lamoka-like points.

Lithic preference: flint 85.0 per cent (46), chalcedony 11.1 per cent (6), and argillaceous shale (2). Local black flints are strongly preferred. Total sample size: 54.

	Length (inches)	*Width*	*Thickness*
Range	2.85-1.25	1.10-.80	.45-.27
Average	2.11	.93	.35

(based upon 10 specimens)

Comments: This is a newly recognized type. From the association of the type with the deeper levels at the Brodhead-Heller and Faucett sites, as well as very similar forms from the Sylvan Lake Rockshelter near Poughkeepsie, New York (Funk 1965: 147, Fig. 3, Nos. 2, 4, 22-31, and 43), it is apparent that this is a Late Archaic type.

In the Upper Delaware, three specimens were found beneath the Perkiomen level in Level IV, tan sand Zone B, of the Brodhead-Heller site. They are considered to be part of the Delaware Valley Archaic complex for which there is a radiocarbon date of 1710 B.C. ± 120 years. Excavations at the Faucett site yielded a single example of the type in a stratified context at 48 to 54 inches below datum. This level is the bottom of the Perkiomen component radiocarbon dated to 1500 B.C. ± 120 years and 24 inches above a deep Archaic component dated 3230 B.C. ± 200 years. Funk's (1965: 137) comparable assemblage from Sylvan Lake dates 2210 B.C. ± 140 years. A span of time from 2500 B.C. to 1700 B.C. is a suggested time range for this Lamoka-like type.

The type is fairly common in the Upper Delaware. About 15 to 20 sites have yielded this type, including the Macpherson hilltop site.

Egypt Mills (new type) (Fig. 116 D)

Description: These are stemmed points of medium length with a fairly broad blade and an expanded base. Blade edges tend to be straight with only one example having slightly excurvate edges. Irregular edges appear on several specimens as a result of use as a knife. Some have a slightly asymmetrical configuration. In cross section they are irregularly biconvex. Shoulders on a majority are rounded and the juncture of the blade and the stem is curved. Shoulders on two examples are sharp and form a right angle, and in one instance the shoulder angle is obtuse. Bases are expanded and 80.0 per cent have a straight unretouched base. The remaining examples have a mildly convex base. Because of the weathered condition of the lithic material, it is impossible to determine if basal grinding is present.

Lithic preference: shale 80.0 per cent (8), and argillite
cent (2). Local shale and argillite are the preferred lithic
Total sample size: 10.

	Length (inches)	*Width*
Range	2.30-1.50	1.12-.87
Average	1.90	1.01

(based upon 10 specimens)

Comments: Seven examples of the type were excavated at
Mills site. While context provided only a clue to their ag
tural affiliation, it is likely that this is a minority type of the
Valley Archaic complex. Werner has noted the type at th
No. 1 site in association with the Lackawaxen Stemmed p
he considers it to be a variant of that type. Poor stratigraph
Mills offers the faint suggestion that this point type and t
waxen Expanded Stem subtype are contemporaneous. A ra
date from the Brodhead-Heller site, 1710 B.C. ± 120 years, is
a late and probably terminal date for the latter type.

Typologically the Egypt Mills point is part of the genera
Archaic broadspear tradition. It may be a local translati
Lehigh/Koens-Crispin type into shale. The type is consider
manifestation of that tradition, with locally derived non-
terials used for the production of the type. In the Upper
the type is not common, with examples found on seven or
including the Macpherson hilltop site.

NORTHERN PIEDMONT

Normanskill (Fig. 117 B)

Description: These are well-made and somewhat long an
isosceles triangular points with deep and distinct side notch
edges are straight on 60.0 per cent and mildly excurvate
maining examples. In cross section they are biconvex. The
angle varies. A majority, 68.0 per cent, have an asymmertical
ity resulting in one shoulder with an acute angle and the oth
obtuse angle. Acute and symmetrical shoulder angles occur o
cent while obtuse and symmetrical shoulder angles occur o
cent. Bases are expanded on all examples. Eighty-four per c
straight base, of which three are unretouched or partly un
Eleven per cent have a mildly convex base and one exam
mildly concave base. Slight basal grinding occurs on five spe

Lithic preference: flint 62.0 per cent (18), argillite (3), chert (2), jasper (1), argillaceous shale (3), chalcedony (1), and rhyolite (1). Local black flints are the preferred lithic material. Total sample size: 29.

	Length (inches)	*Width*	*Thickness*
Range	2.22-1.46	.97-.75	.38-.22
Average	1.81	.85	.29

(based upon 10 specimens)

Comments: The type has its center of distribution in eastern New York, especially the Hudson Valley and the tributary rivers (Ritchie 1961: 37). It is found in southern New England in the Connecticut Valley (Fowler 1963: 3, Fig. 1, side-notched No. 5). Ritchie assigns the type to the River phase of the Late Archaic. Two radiocarbon dates for the type from the Brent site in the Mohawk Valley are at variance: 1350 B.C. ± 200 years and 1930 B.C. ± 100 years. The latter date is considered to be more nearly correct (Ritchie 1965a: 126).

In the Upper Delaware, Normanskill points are rather common. They have been found on the surface of about 10 to 14 sites, and they have been excavated in a mixed Late Archaic context at the Egypt Mills site. Werner reports that it is a popular type (15 specimens) at the Zierdt site, where it is associated with several Laurentian types.

Normanskill-like (Fig. 117 C)

Description: This is a generalized category of proportionately long- and narrow-bladed side-notched points. Blade edges are excurvate on a majority while others have straight edges. In cross section they are biconvex and some are asymmetrically biconvex. Shoulders are rounded, forming an obtuse angle on about 59.7 per cent, sharply barbed on 19.4 per cent, while on 20.9 per cent the opposing shoulders are asymmetrical. Side notches are medium to large in size. All bases are expanded, but not beyond shoulder width. Thirty-one and four-tenths per cent have straight bases, 30.0 per cent mildly convex, 20.9 per cent angled, 7.5 per cent mildly concave, and 10.2 per cent indeterminate. Ten specimens have unretouched or partly unretouched bases, with six of these having angled bases.

Lithic preference: flint 55.2 per cent (37), argillaceous shale 34.4 per cent (23), chert 8.9 per cent (6), and chalcedony (1). Local black flints are the preferred lithic material, with argillaceous shale a fairly strong second preference. Total sample size: 67.

	Length (inches)	*Width*	*Thickness*
Range	3.43-1.63	1.21-.65	.37-.21
Average	2.22	.87	.28

(based upon 10 specimens)

Comments: This category is in part a catchall with some of those included in this group intergrading with Normanskill and Lamoka-like. The group was established to accommodate many less than crisp forms. Several types may be present, but without more knowledge of the "type" and better context, further subdivision seems unwarranted. One example from this group resembles the three wide, side-notched bases found at the Brodhead-Heller site, which have been radiocarbon dated to 1440 B.C. ± 100 years. Charles Hayes, Rochester Museum and Science Center (February 5, 1969: personal correspondence), recognizes the difficulty in dealing with narrow-blade side-notched points from the Farrell Farm site in western New York. He refers to this class of points as Normanskill-like and Lamoka-like. Two radiocarbon dates from that site, 2030 B.C. ± 160 years and 1940 B.C. ± 120 years, are considered as reliable dates for at least some of these similar points from the Delaware Valley.

This general form is found in the Northeast wherever moderately long and narrow-blade side-notched points occur. Similar forms are illustrated for the Seaman site in eastern New York (Johannessen and Glamm 1965: 46, Fig. 10, Nos. 2-7). In the Upper Delaware these points are found on at least 15 to 20 sites.

Lamoka-like (Fig. 117 E)

Description: This is a broad category of narrow-bladed, wide side-notched, and stemmed points. Fifty-two per cent of the blade edges are straight, 37.5 per cent mildly convex, 7.7 per cent indeterminate, and four examples incurvate. The latter form is produced by reshaping, and many show evidence of having been rechipped. In cross section they range from biconvex to asymmetrically biconvex. Shoulders are rounded to sharp with the majority rounded. Notches are fairly wide and shallow and bases are slightly expanded. Fifty per cent of the bases are mildly convex, 25.4 per cent straight, 18.3 per cent angled, and 6.3 per cent indeterminate. Unretouched or partly unretouched bases occur on 23.3 per cent, with more than half of the specimens with this basal treatment found on those with the angled base.

Lithic preference: flint 79.9 per cent (112), chert 8.5 per cent (12), argillite 4.9 per cent (7), siltstone (5), chalcedony (4), argillaceous shale (1), and jasper (1). Local black flints are the strongly preferred lithic material. Total sample size: 142.

	Length (inches)	*Width*	*Thickness*
Range	2.61-1.09	.85-.61	.36-.23
Average	1.86	.77	.30

(based upon 10 specimens)

Comments: Some specimens in this group intergrade with Lamoka while others intergrade with Normanskill-like. Funk, in his work at the Sylvan Lake Rockshelter in the Hudson Valley, had the problem of dealing with a similar assemblage of side-notched to stemmed narrow-blade points. He uses the term Lamoka-like to refer to this group (Funk 1965: 147, Fig. 3, Nos. 5-7, 10, 11, 19, 23, 24, 26, 43). These points are from the middle and upper portions of Stratum 2 at Sylvan Lake, for which there is a radiocarbon date of 2210 B.C. ± 140 years.

A very similar projectile point assemblage was reported for the Farrell Farm in western New York by Charles Hayes, Rochester Museum and Science Center, who refers to the points as Lamoka-like and Normanskill-like (Hayes February 5, 1969: personal correspondence). The assemblage is radiocarbon dated 2030 B.C. ± 160 years and 1940 B.C. ± 120 years. (See Normanskill-like for additional information.)

In the Upper Delaware Valley this is a common form. About 25 to 35 sites are represented by the collection, including the Macpherson hilltop site by seven specimens. Similar points have been excavated in a mixed Late Archaic context at the Egypt Mills and Zierdt sites, and they are found in the middle level of the Schneider site. Several unrecognized and as yet untyped points are probably present in this broad group. It is likely that these are mostly Late Archaic types, although some may be Early Woodland and perhaps a few are Middle Woodland.

OTHER ARCHAIC

Eshback (new type) (Fig. 116 E)

Description: These are moderately broad, basally notched, isosceles triangular points. Blade edges are mildly excurvate on a majority, with only three specimens having straight edges. The points are fairly thin and well made and in cross section they are biconvex. Shoulders extend below the base on half the examples. Basal notches are small to medium and the basal notch is perpendicular to the base on a majority. On a minority the notch is at the corner. Eighty-seven per cent have a straight base while the remainder have an unretouched base. Basal grinding occurs on 75.0 per cent.

Lithic preference: flint 64.3 per cent (9), argillaceous shale (3), chert (2). Local flints are the preferred lithic material. Total sample size: 14.

	Length (inches)	*Width*	*Thickness*
Range	2.30-1.00	1.59-.82	.27-.16
Average	1.49	1.13	.22

(based upon 10 specimens)

Comments: Although the data are not unassailable, the Eshback point is believed to be a minor type of the Late Archaic. The best evidence for this hypothesis is stratigraphic. At the Faucett site a point with a broken base, but apparently of this type, was found 67 inches below datum. It was in a stratum 11 inches above a deeper Archaic component which is radiocarbon dated 3230 B.C. ± 200 years, and it was separated by a sterile level from the later Perkiomen and Macpherson components. The latter component dated 1500 B.C. ± 120 years.

At four sites in the Upper Delaware the type has been excavated in a mixed Late Archaic context. Marchiando has observed this situation at Friedman II and Pahaquarra sites, while Werner notes an association of the type with Brewerton and Lackawaxen forms at the Herring No. 1 site. At the Zierdt site one specimen is associated with Brewerton and Vosburg types. Seven examples of the type were found at Lee's Terrace just below the Late Woodland component. An Archaic component was present at this site, but no Middle Woodland component was recognized.

Based upon observations of the association of the Eshback type in a number of surface collections throughout the area, Leslie believes that the Eshback point is a Late Archaic type. He also observes that there is a low yield of this type from sites in the Upper Delaware Valley (Leslie February 24, 1969: personal correspondence). At the Abbott Farm Excavation 12, the type was found in a mixed Archaic context, although some Middle Woodland net-marked and cord-marked pottery was present (Cross 1956: Pl. 20b; Marchiando February 19, 1969: personal correspondence).

In southern Lancaster County, at the Erb Rockshelter, five examples were excavated. These are thought to be Middle Woodland and associated with Mockley Net-Impressed pottery (Kent and Packard 1969). Two examples were excavate dfrom the upper two levels of the Kent-Hally site on Bare Island, and they were also considered Middle Woodland (Kinsey 1959b: 116). Both of these sites also contain mixed Archaic assemblages. Two examples of the Eshback type are illustrated by Pool (1939: Fig. 5, Nos. 7, 9) for a rock shelter at Poplar Neck in Berks County, Pennsylvania. These specimens are from a mixed Archaic and Woodland context, which included a variety of notched and stemmed projectile point types, a spearthrower weight, triangular points, and cord-marked pottery.

In summary, for the Upper Delaware Valley, a probable Eshback type has been excavated as a single type from a deep stratigraphic context, several examples of the type were excavated as an apparent single component at a shallow site, and at four sites the type was excavated in a mixed Late Archaic context. The Eshback point is not common, and data from the Macpherson Collection suggest that it was found on eight sites including the Macpherson hilltop site. For this area the type appears to be a minor Late Archaic type. In the lower Susquehanna Valley there is a suggestion that the form might be Middle Woodland. Elsewhere, in the southeastern subarea, the larger Eva point is a basally notched point of the Middle to Late Archaic. Eva points have a long time span, 5000 B.C. to 1000 B.C., although they are considered rare after 3000 B.C. (Bell 1958: 22).

Shriver Expanded Stem (new type after Dragoo and Broyles)

(Fig. 121 A)

Description: These are small, thin, and rather well-made isosceles triangular-shaped points. In cross section they are biconvex. Blade edges are excurvate on a majority, with only a few examples having straight edges. There are two basal forms. On one form corners of the lower blade edge have been removed leaving a small broad stem, and this group accounts for 63.0 per cent of the collection. The second group, 37.0 per cent, has narrower stems and more conspicuous shoulders. Bases are slightly expanded on nearly all specimens. Forty and one-tenth per cent of the bases are straight, 33.3 per cent mildly concave, 22.3 per cent convex, and 3.7 per cent indeterminate. Nearly 60.0 per cent show evidence of basal grinding.

Lithic preference: flint 68.6 per cent (37), chert 11.1 per cent (6), argillaceous shale 11.1 per cent (6), argillite (3), jasper (1), and chalcedony (1). Local black flints are the preferred lithic material. Total sample size: 54.

	Length (inches)	*Width*	*Thickness*
Range	1.60-.91	.93-.69	.30-.16
Average	1.29	.81	.22

(based upon 10 specimens)

Comments: Bettye Broyles and Don Dragoo have indicated in conversation that this type is similar to what they intend to call Shriver Expanded Stem in an anticipated publication on projectile point types by Broyles. The type name is obtained from a large group of points from the Gay Shriver site in Greene County, Pennsylvania (Stewart and Dragoo 1954). The type is considered to be part of the widespread Late Archaic Laurentian tradition in the upper Ohio Valley. Dragoo found similar points in all levels of the Rohr shelter, Monongalia County, West Virginia, and he notes that these points are a major point type in that area for a majority of Archaic sites. They appear to have remained in use over a long period of time (Dragoo 1959: 180-1). These points resemble Types F and G of Group 1, stemmed projectile points, from the Mill Pond site, Monroe County, in southeastern West Virginia (Broyles 1964: 26-7). There is some resemblance to the Calvert type found at the Accokeek Creek site near Washington, D. C. (Stephenson 1963: 143-4, Pl. 24, K-V). Calvert points are also found at the Marcey Creek site.

In the Upper Delaware the type is rather common, with about 12 to 14 sites represented by the collection, including the Macpherson hilltop site with seven specimens. Six specimens were found at the Herring No. 1 site, with one example associated with Lackawaxen Stemmed points, while 21 specimens of a closely related straight-stemmed form were found in nearly all levels of the Zierdt site (Werner March 19, 1969: personal correspondence). There are insufficient data on the proper context for this type in the Upper Delaware, but probably it is a Late Archaic form, although it is not recognized for New York and other nearby areas.

Eared (Fig. 121 B)

Description: These are small isosceles triangular points. The blade is mildly excurvate on most specimens and straight on a minority. They are generally thin and biconvex in cross section. Sixty-seven and one-half per cent of the bases are concave, 26.2 per cent straight, and 6.3 per cent convex. The greatest width occurs at the base on slightly over half, while the greatest width is at the shoulder on the remaining examples. Less than 50.0 per cent have basal grinding. Notches are small and on some they are rather faint.

Lithic preference: flint 60.7 per cent (28), argillite 10.9 per cent (5), chalcedony 10.9 per cent (5), argillaceous shale (4), chert (3), and quartz (1). Local flints are the preferred lithic material. Total sample size: 46.

	Length (inches)	*Width*	*Thickness*
Range	1.66-.82	.82-.62	.23-.17
Average	1.27	.72	.20

(based upon 10 specimens)

Comments: This group includes some intergrades between Shriver Expanded Stem and Brewerton Eared Triangle. The Eared type resembles some of the Group 3, Type B specimens from the Mill Pond site, West Virginia (Broyles 1964: 35). This might be a minor Late Archaic type in the Upper Delaware Valley, although there are insufficient data to confirm this contention. The Eared type is rather common and is found on about 12 to 15 sites, including the Macpherson hilltop site.

Lamoka (Fig. 117 D)

Description: These are small stemmed or shallow side-notched points which are relatively thick in proportion to their size. They are fairly well made and generally biconvex with a longitudinal medial ridge. Some are asymmetrical. Blade edges are mildly excurvate on a majority, with a few examples having straight blade edges. Tangs are generally rounded, as are shoulders. Eighty-two per cent have side notches and the others have small stems. The base is convex on 60.0 per cent and unretouched on the remaining specimens. One example has slight basal grinding.

Lithic preference: flint 82.4 per cent (14), chert (3), and light gray chert (1). Local black flint is the preferred lithic material. Total sample size: 18.

	Length (inches)	*Width*	*Thickness*
Range	1.60-1.06	.72-.55	.31-.17
Average	1.33	.66	.24

(based upon 10 specimens)

Comments: The center of distribution for this type is western and central New York from the Genesee country across the Finger Lakes to Oneida Lake (Ritchie 1965a: 40). It is also found eastward in the Hudson Valley, the northern portions of Pennsylvania, and westward into Ontario (Ritchie 1961: 29). A western variant is the Dustin point, which occurs as a surface find on sites of the Lower Peninsula in Michigan (White 1963: 105).

The chronological position and cultural affiliation of this type are firmly established for New York state. Seven radiocarbon dates provide a median date of about 2500 B.C. Lamoka is not a common type for the area. It is found on about nine sites.

Bifurcate-Stemmed (Fig. 121 C)

Description: These are distinctive small to medium-sized isosceles triangular points with a notched base. Blade edges tend to be straight, with several examples having excurvate edges. A majority have damaged or reshaped edges. Tangs are flared. Deep basal notches are present on 60.0 per cent and the others have shallower notches. Shoulders are about evenly divided between sharp and rounded. Basal grinding is absent on all specimens.

Lithic preference: flint 58.0 per cent (11), jasper (3), chert (2), and argillaceous shale (2). Local flint is the preferred lithic material. Total sample size: 18.

	Length (inches)	*Width*	*Thickness*
Range	2.15-1.24	1.25-.82	.37-.20
Average	1.59	1.02	.25

(based upon 9 specimens)

Comments: Bifurcate-stemmed points have a nearly continental distribution. Fitting (1964: 92-4), in an analysis of the eastern bifurcate point, recognizes two types. A large blade form is considered to be prior to 5000 B.C., while a smaller form with a triangular blade appears to range from Late Archaic to Early Woodland.

A majority of the bifurcate-stemmed points from the Macpherson Collection resemble the Kanawha Stemmed type, which at the St. Albans site in the Kanawha Valley, West Virginia, is found in Zones 2 and 4. A radiocarbon date for the latter zone is 6210 B.C. ± 100 years (Broyles 1966: 27-8). Other points resemble the St. Albans Side-Notched (variety A) point from Zone 12 at the same site, radiocarbon dated to 6880 B.C. ± 700 years (Broyles 1966: 23-5). One or two specimens are similar to the LeCroy Bifurcated point. These related bifurcated point types are firmly established as Early Archaic for the St. Albans site.

Many sites in the Northeast with mixed Archaic components have the bifurcate-stemmed point as a relatively minor trait. These sites include Abbott Farm, Sheep Rock, Kent-Hally, Titicut, Accokeek Creek, and many others. For the Upper Delaware Valley the type is not common and is found on about 12 sites. Usually the type is a surface find, and in the Macpherson Collection only the Egypt Mills site yielded a significant number (five). Werner (March 19, 1969: personal correspondence) reports that a bifurcate-stemmed point was found beneath the Laurentian level at the Zierdt site. Leslie (1963c: 73) has also noted the presence of this type for the area, and he recognizes both a long and a stubby form. For the Northeast the bifurcate-stemmed point is considered to be a minority type of the Archaic, and one form of this type is Early Archaic.

BROADSPEAR TRADITION

Lehigh/Koens-Crispin Broadspear (Fig. 118 C-E)

(With Herbert C. Kraft)

Description: These are distinctive, well-made, broad, and slightly asymmetrical points with wide trapezoidal stems. The length-to-width ratio ranges from about 1.5 to 1.0 to 1.8 to 1.0. Blade edges range from excurvate through straight to incurvate, and a number of those with incurvate edges apparently have been reshaped and used as knives. In cross section they are mildly biconvex, with the argillite specimens nearly flat. Shoulders are almost equally divided between sharp and rounded. The shoulder angle is about equally divided between acute and obtuse, with an obtuse angle formed on at least one shoulder of 30.0 per cent of the sample. Stems on 68.5 per cent are slightly converging, 21.0 per cent are straight and the remainder are slightly expanded. A majority of the bases are convex, while the others are straight, unretouched, and one is concave. Basal grinding occurs on nearly 70.0 per cent of those specimens made of flints and jaspers. The argillite examples are too deeply weathered to determine if basal grinding is present.

Lithic preference: argillite 56.0 per cent (23), jasper 29.4 per cent (12), and chert 14.6 per cent (6). This sample size includes 28 specimens from the Macpherson Collection and 13 examples, all made of argillite, excavated from the Miller Field site by Kraft.

Miller Field Site Specimens (Fig. 118 C)

	Length (inches)	*Width*	*Thickness*
Range	2.85-2.00	1.73-1.25	.28-.18
Average	2.21	1.41	.21

(based upon 7 specimens)

Macpherson Collection (Fig. 118 D, E)

	Length (inches)	*Width*	*Thickness*
Range	3.56-1.72	1.90-1.22	.45-.22
Average	2.44	1.52	.31

(based upon 9 specimens)

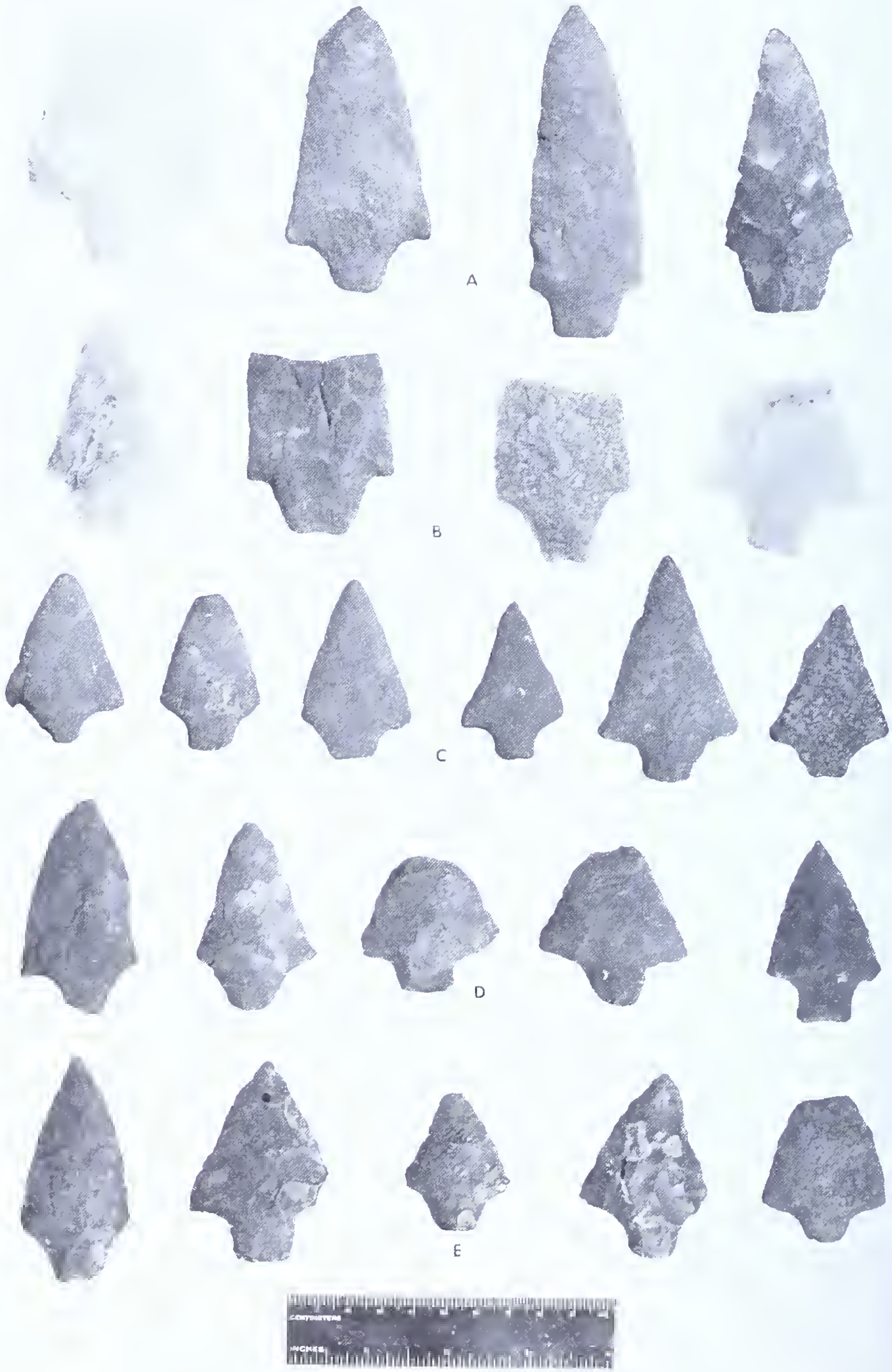


Fig. 118. BROADBLADE PROJECTILE POINT TYPES: A, B, large broad-bladed, corner-removed points; C, Koens-Crispin broad spears, argillite (Miller Field site); D, E, Lehigh/Koens-Crispin broad spears.

An additional group (Fig. 118 A, B) of points of the Lehigh/Koens-Crispin type is conspicuous because of their greater size and the lithic material from which they are fashioned, and except for the straight basal configuration, these resemble the Savannah River Stemmed type described by Coe (1964: 44-5). The largest example is more than four inches long, while a large basal fragment is nearly 2.50 inches wide.

Lithic preference: quartzite (5), argillite (3), rhyolite (2), jasper (1), chalcedony (1), and andesite (1). Total sample size: 13.

The Lehigh type was recognized and described by Witthoft (1953: 21-2). As a result of excavations in eastern New York, Ritchie identified a Snook Kill phase, which has a point type of the same name as a diagnostic trait (Ritchie 1958: 91-8; 1961: 47-8; 1965a: 134-41). This type intergrades with and is identical to the Lehigh point. The Snook Kill phase is radiocarbon dated to 1470 B.C. ± 100 years.

Lehigh points are distributed in the Lehigh, Upper Delaware, and Hudson valleys. The type extends into southern New England and eastern Massachusetts, where the Lehigh/Koens-Crispin form is commonly termed "corner-removed" (Fowler 1963: 3; Fig. 1). For southern New England Dincauze (1968: 82) recognizes the Call group of burial sites, dating 1670 B.C. ± 110 years, which she suggests represents the Lehigh-Snook Kill complex (phase) for the area.

The Koens-Crispin point was first recognized and illustrated by Hawkes and Linton (1916). Cross (1941: 81-90; 117-27) refers to the type in the report on the Koens-Crispin site, and Coe postulates an affinity between this type and the Savannah River Stemmed point found in the Carolina Piedmont. Specimens of the latter type are generally made of quartzite, rhyolite, or andesite, and the type is radiocarbon dated to 1944 B.C. ± 250 years (Coe 1964: 44-5; 119). Similar points are fairly widespread throughout the middle Atlantic region. In the Potomac Valley at the Marcey Creek site they are found in apparent association with steatite bowls and steatite-tempered pottery (Manson 1948: 223-7).

The Koens/Crispin point of argillite is common throughout south-central New Jersey, but is not abundant in the Upper Delaware Valley. Thirteen examples are from the Miller Field site, four specimens were uncovered by Kraft at Harry's Farm site, and five examples are from a Late Archaic context at the Zierdt site.

The jasper Lehigh form is fairly common for the area. About 15 sites are represented by this type in the Macpherson Collection. None is from the Macpherson hilltop site. At the Peters-Albrecht (36-Pi-22) site a hearth containing a basal fragment of a Lehigh point yielded a radiocarbon date of 1720 B.C. ± 100 years (Kinsey 1968: 245-7). A pure Lehigh component has yet to be discovered, but frequently one or two specimens are found in the context of a Perkiomen component. This situation has occurred at Faucett, Brodhead-Heller, Friedman II, and Miller Field sites. At the Miller Field site a single Koens-Crispin point was found in a pit with five Perkiomen points and a polished celt or adze. Charcoal from this pit yielded a date of 1720 B.C. ± 120 years (Kraft 1970). Four jasper Lehigh points were excavated at the Miller Field site.

The Lehigh/Koens-Crispin type is believed to reflect regional and lithic variations of the same projectile point type. The Lehigh variant is generally made of jasper, and its distribution is greatest in areas to the north of the Koens-Crispin type. The latter type shows a strong preference for argillite, with its center of distribution located in the middle and lower Delaware Valley. In the Pennsylvania Piedmont, quartzite broad points are found which resemble the Lehigh/Koens-Crispin form. Witthoft (1959b: 81-3) has referred to certain examples of this form as corner-removed and he illustrates several from the Long site in Lebanon County. Snook Kill, Lehigh, Koens-Crispin, and Savannah River Stemmed types, as well as certain unnamed broad corner-removed forms, belong to a large family of similar and closely related Late Archaic broad points.

Perkiomen Broadspear (Fig. 119 D)

Description: These are distinctive, well-made, broad and flat, asymmetrical points with a narrow stem. Length-to-width ratio is about 1.4 to 1.0. Blade edges are straight on a majority, slightly excurvate on a minority, and one example has incurvate edges as a result of reshaping. In cross section, a majority are relatively flat and biconvex. A few are asymmetrically biconvex. Opposing shoulders are not usually identical on the same specimen. Seventy-two per cent have at least one sharp shoulder while the opposite shoulder is rounded. Stems are narrow and in all instances bases are slightly expanded. Bases tend to be straight, although a few are mildly convex and, rarely, concave. A few have sharp ears while a majority are rounded. At least 75.0 per cent have been used as knives or cutting implements.

Lithic preference: jasper 54.1 per cent (20), flint 31.0 per cent (11), chert (2), chalcedony (2), argillite (1), and rhyolite (1). Non-local jasper is the preferred lithic material. Total sample size: 37.

	Length (inches)	*Width*	*Thickness*
Range	2.11-1.52	1.45-1.26	.37-.19
Average	1.79	1.34	.27

(based upon 7 specimens)

Comments: This type was first recognized and described by Witthoft (1953: 16-20) and later by Ritchie (1961: 42-3). Its range of distribution is eastern Pennsylvania, especially the Schuylkill Valley to the headwaters of the Swatara Creek and the Delaware Valley northward to the Hudson River. It is found in western New York at the Piffard site and as part of the Frost Island phase in central New York at the O'Neil site (Ritchie 1965a: Pl. 50; Pl. 51, Nos. 8, 18, 19). The type is reported for Ohio, but it is considered very rare in that area (Prufer and Sofsky 1965: 33-4).

The type is fairly common in the Delaware Valley south of Milford. It has been found on about 15 sites by Macpherson and, perhaps significantly, none was found on the hilltop site. The type has been found in the now partially flooded Paupack Valley west of the Delaware (Leslie 1965a: 59). Perkiomen points were excavated in a Late Archaic context at Faucett, Brodhead-Heller, Friedman II, Miller Field, Herring No. 1, and Zierdt sites. The Perkiomen component at the Miller Field site is radiocarbon dated to 1720 B.C. ± 120 years; at the Brodhead-Heller site it dates to 1620 B.C. ± 100 years; and at the Faucett site it dates to 1500 B.C. ± 120 years.

Susquehanna Broadspear (Zimmermann site) (Fig. 119 C)

Description: These are relatively large and distinctive, broad-blade, semilozenge-shaped points with prominent side notches. Blade edges are straight on seven specimens, four are mildly excurvate, while eight are reworked. All specimens have an obtuse shoulder angle, of which 58.0 per cent are slightly rounded and 42.0 per cent are sharp. Seventy-four per cent have a concave base and the remainder have a straight base. Basal ears are prominent on all examples, with 42.0 per cent having sharp ears and 58.0 per cent having slightly rounded and less sharp ears. Notching is well-defined, and grinding is present in the notches and along the bases of all examples except for one unfinished specimen. Most are mildly asymmetrical.

Lithic preference: rhyolite 57.5 per cent (19), chert 33.3 per cent (11), argillite (2), and flint (1). Non-local rhyolite is the preferred lithic material. Total sample size: 33.

	Length (inches)	*Width*	*Thickness*
Range	3.10-2.05	1.47-.91	.33-.27
Average	2.54	1.17	.30

(based upon 9 specimens)

Comments: This type was recognized and named by Witthoft (1953: 7-9) largely on the basis of widespread surface collections from the Susquehanna Valley. It is a widely distributed broadspear form ex-

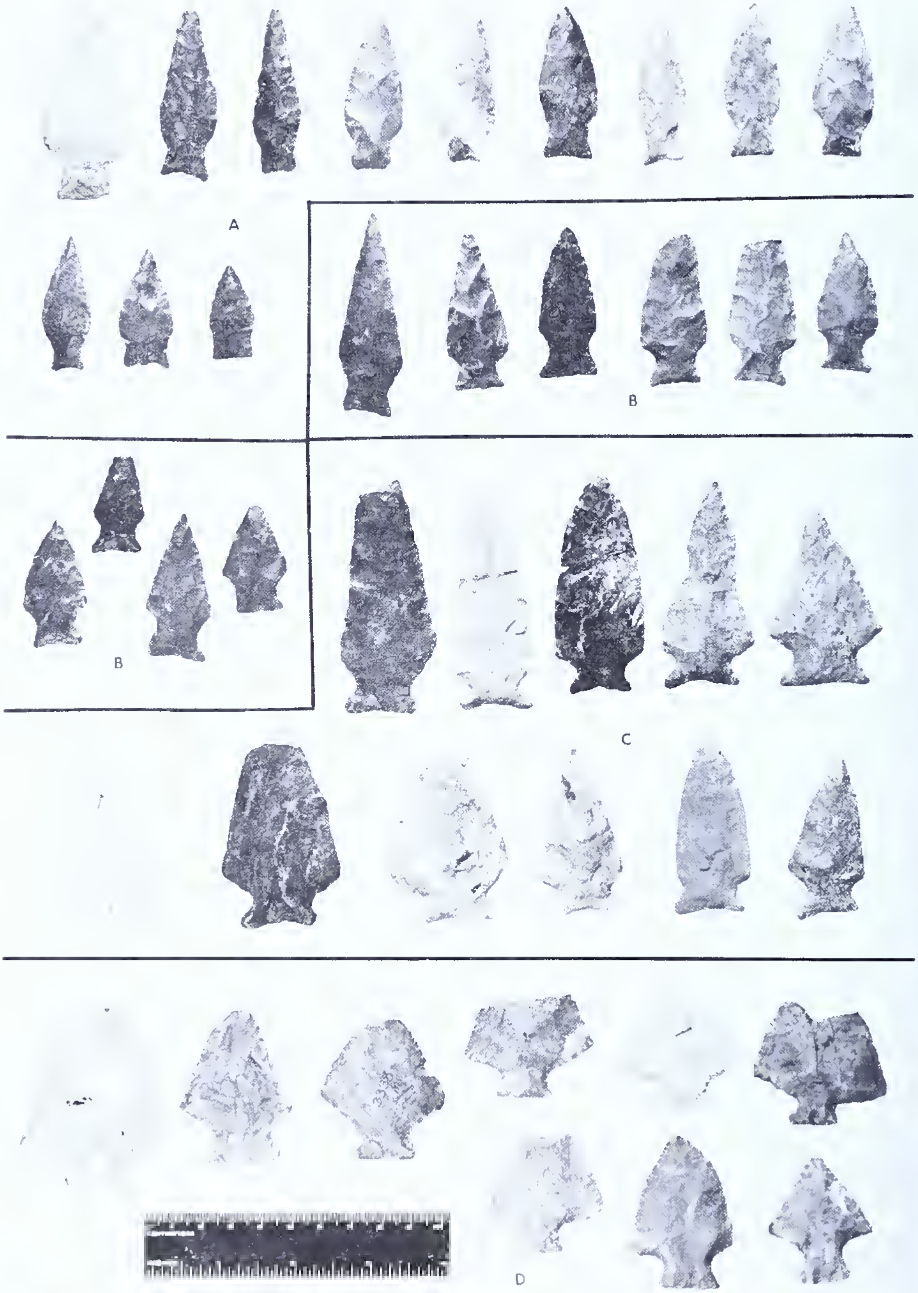


Fig. 119. ORIENT, DRY BROOK, SUSQUEHANNA, AND PERKIOMEN projectile point types: A, Orient fishtail points; B, Dry Brook fishtail points (Zimmerman site); C, Susquehanna broad spears (Zimmerman site); D, Perkiomen broad spears.

tending from eastern and southern New England to the Chesapeake Bay and the Potomac Valley. Some specimens are found in the upper Allegheny Valley. The type is especially prevalent from the Chesapeake up the Susquehanna to the West Branch and the North Branch valleys (Witthoft 1953: 11).

In the upper Ohio Valley the Ashtabula point is recognized as being related and, except for lithic preference, very similar to the Susquehanna broadspear. Throughout the Ohio area this type is generally made of Flint Ridge and Upper Mercer materials (Bell 1960: 4; Prufer and Sofsky 1965: 33).

In eastern Massachusetts Dincauze (1968: 72-7) recognizes the presence of the Susquehanna tradition in the form of the Watertown phase, which dates from 1670 B.C. ± 110 years to 1520 B.C. ± 125 years. Characteristic of this phase are Wayland Notched points (Dincauze 1968: 25-6, 76-8; Pl. 3, No. 4; Pl. 4, No. 6; Pl. 8, Nos. 1, 2) and Mansion Inn blades (Dincauze 1968: 16-7; Pl. 3, Nos. 1-3, 5, 6, 10, 11), which may be unresolved blank forms of the Wayland Notched point. These are frequently made of porphyritic felsites and less commonly of volcanic rocks, quartzites, and other materials. The type is also found at the Oak Island site on the North River (Scothorne 1968: Fig. 4, No. 21), and there are other sites in Massachusetts where these forms have been located.

A Frost Island phase is postulated by Ritchie (1965a: 155-63) as a result of work at the O'Neil site in the Finger Lakes region of central New York. This site is radiocarbon dated to 1250 B.C. ± 100 years and appears to have a combination of projectile point types which includes Dry Brook, Susquehanna, Perkiomen, and also Genesee. On Plate 51, Nos. 10 and 14 are examples of Susquehanna points (Ritchie 1965a: 157).

Along the Potomac River, Charles W. McNett, Jr., American University, has excavated a Susquehanna component at the Ruppert Island site near Glen Echo, Maryland. The component consisted of six Susquehanna points, a drill, a quarry blank, and numerous fragments of soapstone. A soapstone quarry is located opposite Ruppert Island on the Virginia bluffs. He also reported that the Monocacy site, located nearby at the junction of the Monocacy and the Potomac rivers, is a stratified site containing a Susquehanna component. The site has been studied by Havard Ayers as a graduate student at Catholic University.

Susquehanna broadspears are not common in the Delaware Valley south of Milford, although they are somewhat more common north of Milford. There is only one example of this type in the Macpherson

Collection. The Zimmermann site, where 33 specimens were excavated, supplies the best data, and this information was provided by Werner. Charcoal collected at this site from Feature 226, Hearth 59, assayed at 1650 B.C. ± 80 years, which dates Level 4 and the Susquehanna component.

LATE ARCHAIC TO EARLY WOODLAND

FISHTAIL TRADITION

Dry Brook (new type by David J. Werner) (Fig. 119 B)

Description: These are moderately broad to narrow fishtail points. Side notches are distinct, wide, and generally shallow, although on some examples the notches are moderately deep. Shoulders are well-defined, ranging from sharp to rounded. Asymmetry may cause opposing notches and shoulder angles to vary in size and shape. On a majority an obtuse angle is formed at the shoulder or junction of the blade and stem. Ears are rounded and rarely sharp. Bases are straight to mildly concave, with 64.0 per cent having the former configuration. Grinding occurs on the base and in the notch on 66.0 per cent of the sample.

Dry Brook points were made by percussion chipping from roughly shaped quary blanks, with the final stage accomplished by pressure flaking. A study of waste chipping from several workshops reveals the presence of three types of flakes. The first is an irregular free flake struck off in the shaping of the crude blank. The second is a distinctive thin, broad, and sharp-edged flake produced by the thinning process. This flake is typical of those found on sites containing broadspear and fishtail components. Finally, there are tiny pressure flakes derived from the retouching of the notches, blade edge, and tip.

Lithic preference: gray chert 59.3 per cent (161), black Helderberg flint 20.5 per cent (55), gray and tan chert 11.4 per cent (31), argillaceous shale 2.2 per cent (6), mottled gray chert (5), white chert (4), chalcedony (4), red jasper (2), black and tan chert (2), and light gray chert (1). Non-local cherts and flnits are the preferred lithic material. The Zimmermann sample size is 271, of which 84 specimens were used to obtain comparative averages. The Macpherson Collection yielded 38 points of this type.

Zimmermann Site

	Length (inches)	*Width*	*Thickness*
Range	2.75-1.10	1.10-.69	.30-.21
Average	1.87	.83	.27

(based upon 84 specimens)

One exceptional specimen of Helderberg flint is 4.10 inches long, while the opposite extreme is achieved by an example made of chalcedony measuring 1.00 inch in length.

Comparative Averages

	Length (inches)	Width	Thickness
Dry Brook:			
Zimmermann; 84 specimens	1.87	.83	.27
Brodhead-Heller; 5 specimens	1.99	.82	.28
Orient:			
Ritchie (1959: 32) 19 specimens	2.09	.75	.32
Macpherson Collection; 160 specimens	1.90	.80	.32
Faucett; 7 specimens	1.50	.71	.30
Brodhead-Heller; 5 specimens	1.93	.75	.27

Comments: The Dry Brook point intergrades with Orient and the smaller Susquehanna broadspears. The main distinction between Dry Brook and Orient is that the former has more sharply angled shoulders while shoulders on Orient points are more rounded and sloping. Orient specimens tend to be slenderer. Some examples may have one shoulder typical of Orient, while the opposite shoulder resembles the Dry Brook form.

The type is found in eastern Pennsylvania, including the middle and Upper Delaware. These points resemble, in the terminology used by some collectors, the so-called "serpent-head" form (Witthoft 1953: 22) or side-notched after Cross (1941: 57, Pl. 16b, No. 12). In eastern New York they are found in the middle and lower Hudson Valley (Ritchie 1959: 31-2, 90-1, Pl. 53, Nos. 5-8, 18-9) and at the O'Neil site along the Seneca River in Cayuga County, central New York. For the latter site, Ritchie illustrates projectile point types similar to Dry Brook (1965a: Pl. 51, Nos. 6, 9, 13). The O'Neil site provided a radiocarbon date of 1250 B.C. ± 100 years for the Frost Island phase. In Massachusetts some of the points in Dincauze's Coburn Group (1968: Pl. 20, No. 6) resemble this type, and for Martha's Vineyard Ritchie (1969b: Pl. 11, No. 9) illustrates a Dry Brook point, although he refers to it as a Susquehanna broadspear.

A study of the Vernon Leslie Collection, Honesdale, of materials from 27 sites between Cochecton and Egypt Mills reveals the presence of the type on 13 sites (Leslie 1946a; 1946b). About 14 site locations are represented by the Macpherson Dry Brook points and none is from the hilltop site. In the Upper Delaware, the Dry Brook type has been excavated at the Zimmermann, Broadhead-Heller, Peters-Albrecht (36-Pi-21), Brodhead, and McCann sites. A radiocarbon date for the Dry

Brook component of the Zimmermann site is 1280 B.C. ± 120 years, and the Orient component at Brodhead-Heller, which contains a mixture of Orient and Dry Brook types, is dated at 1170 B.C. ± 120 years.

Orient (Fig. 119 A)

Description: These are relatively slender fishtail points with wide, shallow side notches. Blade edges are excurvate on a large majority. Many, especially the smaller specimens, have been reshaped after use as knives or reamers. In cross section these points are biconvex. Shoulders are rounded and sloped on nearly all examples. Side notches are generally wide and shallow. Opposing shoulder angles and notch configurations may be asymmetrical on the same specimen. Ears are sharp and pointed on 28.0 per cent, while the remainder are rounded. Forty-eight per cent have slightly concave bases, 41.0 per cent are straight, and only a few examples have a convex base. Three have an unretouched base.

Lithic preference: flint 38.2 per cent (61), chert 33.2 per cent (50), jasper 22.2 per cent (35), argillaceous shale 7.0 per cent (11), and chalcedony (1). The lithic preference is for local black flints and cherts. Total sample size: 158.

	Length (inches)	*Width*	*Thickness*
Range	2.80-1.60	1.09-.55	.35-.23
Average	1.98	.77	.28

(based upon 10 specimens)

Comments: Orient and Dry Brook fishtail points intergrade. In the Upper Delaware, Orient is derived from Perkiomen and is primarily an Early Woodland type, but it is part of a fishtail tradition which has its origins in the Late Archaic. The type has been described and named by Ritchie (1959: 31-2; 1961: 39).

In Massachusetts the type seems to be fairly common, Robbins (1967: Fig. 1, Nos. 10, 11) illustrates the type for the Titicut site, Scothorne (1968: 44, Fig. 4, No. 35) records it at the Oak Island site, and Dincauze (1968: Pl. 8, No. 11) illustrates a probable example of the type. There are also other examples. In the lower Delaware, Cross (1956: Pl. 20b) shows an example which is included in the sixth type of her side-notched category, and this type constitutes 11.0 per cent of the projectile point sample from the Abbott Farm (Cross 1956: 73). For Virginia, Holland (1955: Pl. 28) illustrates a probable Orient type made of quartz, and some of Stephenson's Vernon type from the Accokeek Creek site (1963: Pl. 24, G, H) appear to resemble Orient and

Dry Brook types. The semilozenge form is also found in the Susquehanna Valley (Kinsey 1959b: 115-6).

Five radiocarbon dates from sites on Long Island provide an age range from 1043 B.C. to 763 B.C. (Ritchie 1965a: 164). Sites in the Upper Delaware with Orient components for which there are radiocarbon dates are: Miller Field, 1220 B.C. ± 120 years; Brodhead-Heller (Dry Brook and Orient), 1170 B.C. ± 120 years; and the Faucett site, 810 B.C. ± 100 years.

Orient points have been found in the Upper Delaware Valley associated with soapstone bowls, soapstone-tempered pottery, Vinette 1, possibly Exterior Corded/Interior Smoothed pottery, and numerous stone tool types. It is one of the most common projectile point types found in the area. The type has been excavated at Zimmermann, McCann, Lee's Terrace, Brodhead-Heller, Egypt Mills, Faucett, Brodhead, Peters-Albrecht (36-Pi-21), Camp Miller, Miller Field, Friedman II, Pahaquarra, Herring No. 2, Zierdt, Schneider, Manna, and other sites. The Orient points in the Macpherson Collection probably represent 30 to 40 sites, including one example from the hilltop site.

EARLY WOODLAND

Meadowood (Fig. 120 A)

Description: These are medium-sized, thin, well-made points with small side notches. Five examples are cache blades and lack notches. Blade edges are mildly excurvate, while on the few reworked specimens the edges are straight. Four have serrated edges. In cross section they are biconvex. Bases tend to be straight, although three examples have very mildly convex bases. Side notches are small and shallow. Basal grinding is present on all specimens, except one cache blade.

Lithic preference: Onondaga chert 66.6 per cent (8), jasper (2), flint (1) and argillaceous shale (1). Onondaga chert is the preferred lithic material. Total sample size: 12.

Cache Blades

	Length (inches)	*Width*	*Thickness*
Range	2.32-2.01	1.06-.94	.28-.22
Average	2.23	.99	.24

(based upon 5 specimens)

Points

	Length (inches)	*Width*	*Thickness*
Range	1.81-1.10	.87-.63	.35-.16
Average	1.52	.73	.22

(based upon 6 specimens)

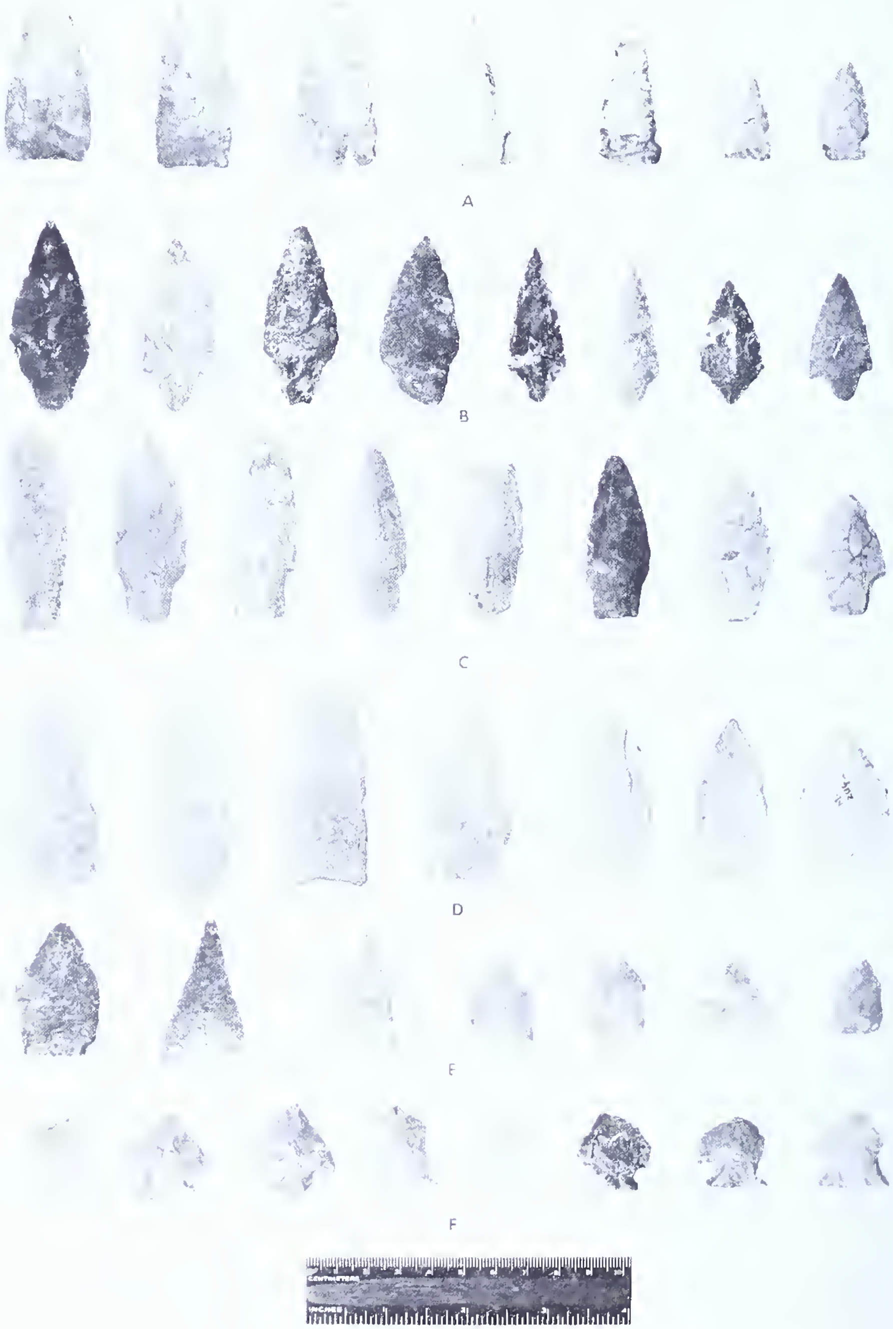


Fig. 120. MEADOWOOD, ROSSVILLE, LAGOON, BROAD-STEM, Jack's Reef Pentagonal, and Jack's Reef Corner-notched projectile point types: A, Meadowood points; B, Rossville points; C, Lagoon points; D, broad-stemmed points; E, Jack's Reef Pentagonal points; F, Jack's Reef Corner-notched points.

Comments: This type has been recognized and described by Ritchie in several publications (1961: 35; 1965a: 179-80). The center for Meadowood points is central New York, where they are primarily found in cremation cemetery sites, although recently a number of habitation sites have been located. The type is also found in western and northern New York, in Ontario, and in the upper Allegheny Valley in western Pennsylvania. In southern New England, a cache of 499 Meadowood blades, apparently of Onondaga chert, was found in a spring at Glastonbury, Connecticut (Bourn 1968: 60-1). Meadowood points of Onondaga chert together with tubular pipes, gorgets, a pop-eyed birdstone, cache blades, and Exterior Corded/Interior Smoothed pottery were found in a component of the Oscar Leibhart site, York County, Pennsylvania, on the lower Susquehanna River, by Donald Leibhart, Wrightsville. In the middle Susquehanna, Harry Kunkle found a cache of about 27 Meadowood blades (including fragments) of Onondaga chert on an island near Halifax, Dauphin County.

The type is not common in the Upper Delaware Valley. About nine sites are represented by the points of this type in the Macpherson Collection. Meadowood points have been excavated at the Van Campen Woods, Zimmermann, and Faucett sites. At the latter site 16 classic Meadowood points and one cache blade, all of Onondaga chert, are from a component that is radiocarbon dated to 750 B.C. ± 100 years. In New York five radiocarbon dates for Meadowood yield a time span of 998 B.C. to 563 B.C.

MIDDLE WOODLAND

Rossville (Fig. 120 B)

Description: These are medium-sized points with the stem tapering to a rounded base. Slightly excurvate blade edges occur on 72.7 per cent of the specimens, 17.1 per cent are straight, and 10.2 per cent are irregular or indeterminate. In cross section a majority are biconvex; some have a high medial ridge on one side. Shoulders are rounded on 70.0 per cent and sharp on the remainder, with a small minority having wide and distinct shoulders. A few examples are lozenge-shaped with almost no break or distinction between the blade and the stem. All stems are tapered. Eighty-one percent of the bases are rounded and 19.0 per cent have a pointed to nearly pointed base. Basal grinding occurs on 9.0 per cent, and where present it is light.

Lithic preference: flint 65.5 per cent (74), argillaceous shale 12.4 per cent (14), argillite 9.7 per cent (11), chert 8.0 per cent (9), jasper

(3), chalcedony (1), and quartz crystal (1). Local flints are the preferred lithic material. Total sample size: 113.

	Length (inches)	*Width*	*Thickness*
Range	2.40-1.38	1.02-.55	.43-.24
Average	1.84	.78	.31

(based upon 10 specimens)

Comparative Averages

	Length (inches)	*Width*	*Thickness*
Macpherson Collection	1.84	.78	.31
Faucett Site (21 specimens)	1.76	.85	.33

Comments: As Ritchie noted (1961: 46), this form has been recognized by a number of authors (Skinner 1915, 1919; Smith 1950; Holland 1955). Rossville points are found on the coastal plain extending from the Chesapeake Bay to southern New England. On Martha's Vineyard, Rossville points are associated with Lagoon points, and they are a minority point type of the Lagoon complex (Ritchie 1969b: 224). For that area, four radiocarbon dates from three stratified sites provide a time span from 520 B.C. to 100 B.C. for Rossville and Lagoon points. These two types are considered to be late Early Woodland and early Middle Woodland, with the Rossville point more prevalent in the latter part of the range.

The Rossville point is the majority type of the Bushkill complex. A radiocarbon date of 480 B.C. ± 80 years at the Miller Field site probably dates the Bushkill complex. Rossville points are believed to be Middle Woodland in the Upper Delaware. There is a relationship between Rossville and Lagoon points, and the general form is a carryover from the Converging Stem subtype of the Lackawaxen group.

In the Upper Delaware the Rossville point is a common type, with about 30 to 35 sites represented by the collection. Five examples are from the Macpherson hilltop site.

Lagoon (Fig. 120 C)

Description: This is a medium to moderately large, narrow-bladed point with a straight squarish stem. It is about two and one-half times as long as it is wide. Blade edges are excurvate or, rarely, straight. In cross section it is biconvex. Shoulders are weak and rounded, with only a small minority having sharp shoulders. On a few the junction of the blade and the stem is barely perceptible. Stems taper slightly. About half have a straight base, while others have a mildly convex base. One example has an unretouched base. Stems and bases tend to be square with rounded tangs. Basal grinding is absent.

Lithic preference: argillaceous shale 47.6 per cent (7), flint (4), argillite (3), and jasper (1). Argillaceous shale is the preferred lithic material. Total sample size: 15.

	Length (inches)	*Width*	*Thickness*
Range	2.37-1.50	1.05-.72	.37-.26
Average	2.05	.90	.31

(based upon 6 specimens)

Comments: The type has been recognized and described by Ritchie (1969b: 224-7, 245) for southern coastal New England. Lagoon points and Rossville points are found associated at the Pratt site on Martha's Vineyard in Stratum 3, which dates to 520 B.C. ± 120 years. In Stratum 2 this type dates to 430 B.C. ± 80 years. At the Pratt site it is considered late Early Woodland. At the nearby Peterson site these types are found in Stratum 2a and date to 360 B.C. ± 100 years, while at the Vincent site in Stratum 2a they date to 100 B.C. ± 80 years. For these two sites, Lagoon and Rossville may be considered early Middle Woodland. The Lagoon type dates from about 520 B.C. to 100 B.C. and is more common toward the early part of this range.

In the Upper Delaware the Lagoon point is a minority type of the Bushkill complex and is believed to be a Middle Woodland form, contemporary with the Rossville type. The type is not common on the Upper Delaware; about 10 sites are represented by the Macpherson Collection. Lagoon points are fairly common in southern New England, but little is known about their distribution outside that region (Ritchie 1969b: 245). This type bears some resemblance to the broad-stemmed form (sometimes called Steubenville Stemmed). The Lagoon point and the broad-stemmed point share a lithic preference for argillite, but they are not identical.

Jack's Reef Corner-Notched (Fig. 120 F)

Description: These are thin, medium-sized, finely made points with well-defined corner notches. Two examples have straight edges, with an angular break near the midsection, which produces a pentagonal shape. Three have excurvate blade edges, while five are too fragmentary to determine the exact form. In cross section they are biconvex. All specimens have fairly deep and distinct corner notches. The straight bases are expanded, with a majority ground smooth.

Lithic preference: flint (5), jasper (2), and chalcedony (1). Nonlocal cryptocrystallines are the preferred lithic material. Total sample size: 8.

Length (inches)	*Width*	*Thickness*
1.75	.90	.19

(based upon 1 specimen)

Comments: Ritchie (1961: 26-7; 1965a: 234, 258) has described these points, which are assigned to the Kipp Island phase and continue in use until Hunter's Home. Two radiocarbon dates for the Kipp Island phase are A.D. 310 ± 100 years and A.D. 630 ± 100 years, while Hunter's Home dates are A.D. 905 ± 250 years and A.D. 955 ± 250 years (Ritchie 1965a: 228, 260). The former is regarded as late Middle Woodland and the latter as early Late Woodland. The type is well known in central New York, although it has a fairly wide distribution. It is found in Michigan, Ohio, Massachusetts, Delaware, Pennsylvania in the Susquehanna and Lehigh valleys, and also in Ontario, Canada. For Delaware, Thomas (1969: 14) has found Jack's Reef Corner-Notched, Jack's Reef Pentagonal, and Levanna triangular points in a mass burial context at the Island Field site, which is identified as the Webb phase.

In the Upper Delaware Valley the type has been excavated in a mixed context at the Faucett, Brodhead, Zimmermann, Manna, and Davenport sites. A radiocarbon date, A.D. 790 ± 120 years, from the Faucett site probably pertains to the Jack's Reef Corner-Notched type. Only two or three sites are represented by the specimens of this type from the Macpherson Collection.

Jack's Reef Pentagonal (Fig. 120 E)

Description: These are thin, medium-sized, finely made pentagonal-shaped points lacking side notches. Seventy per cent have straight and parallel lower blade edges. On two specimens the lower blade edges are slightly expanded, while on one example they are convergent. In cross section these points are biconvex. Six have concave bases, three bases are straight, and one is indeterminate. Basal grinding occurs on two specimens. A majority of the examples were used as knives or cutting implements.

Lithic preference: chert 85.7 per cent (6) and jasper (1). Non-local cryptocrystallines are the preferred lithic material. Total sample size: 7.

Measurements are not provided because the specimens have been severely altered by usage.

Comments: Ritchie (1961: 28; 1965a: 234, 258) has described this type, which is contemporaneous with Jack's Reef Corner-Notched, and attributes it to both the Kipp Island and Hunter's Home phases. Dates for this type are similar to those for Jack's Reef Corner-Notched. The distribution of the pentagonal form is rather widespread, although it is not an abundant type. It is found in Michigan, Ohio, Massachusetts, Delaware, and Pennsylvania in the Susquehanna and Lehigh valleys. The type is also found in Ontario, Canada.

In the Upper Delaware the Jack's Reef Pentagonal type is uncommon, with only four sites represented by the specimens in the Macpherson Collection. Excavated specimens of this type have been found at the Friedman I, Zimmermann, Davenport, and Zierdt sites. A component, represented by 26 specimens, was found at the Manna site, where it is believed that the type is associated with late Point Peninsula pottery of the Hunter's Home phase (Werner, March 19, 1969: personal correspondence).

LATE WOODLAND

Triangular Points (Fig. 121 E-H)

The multiform triangular point has a continental distribution. Except for the special cases of the Beekman Triangle, the Squibnocket Triangle (Ritchie 1969b: 214), and perhaps a few others which may be ascribed to the Late Archaic, triangular points are generally late forms which persist into the Historic period.

The various triangular forms are given a variety of names: Fresno, Maud, Starr, Talco, and Turney (Suhm and Jelks 1962); Matamoros and Tortugas (Bell 1958); Hamilton (Bell 1960); and others. The configuration of each of those types can be duplicated in the Macpherson Collection; however, no purpose is served by making such comparisons. The identification of some of the Upper Delaware Valley triangular forms as Fresno types, a central Texas type, can be very misleading in its implications. A more productive analysis of triangular points would be the study of specimens from controlled excavations on a component by component basis within the confines of a narrow geographic area. Slight variations in form and material might reflect narrow chronological, ethnic, and perhaps even lineage differences.

For purposes of this study, three triangular types, Levanna, Madison, and elongate triangular, are recognized. A fourth category, generalized triangular, includes all other varieties. Triangular blanks (33) were not considered.

Triangular points are the most common form in the Upper Delaware Valley, as they are elsewhere throughout most of eastern United States.

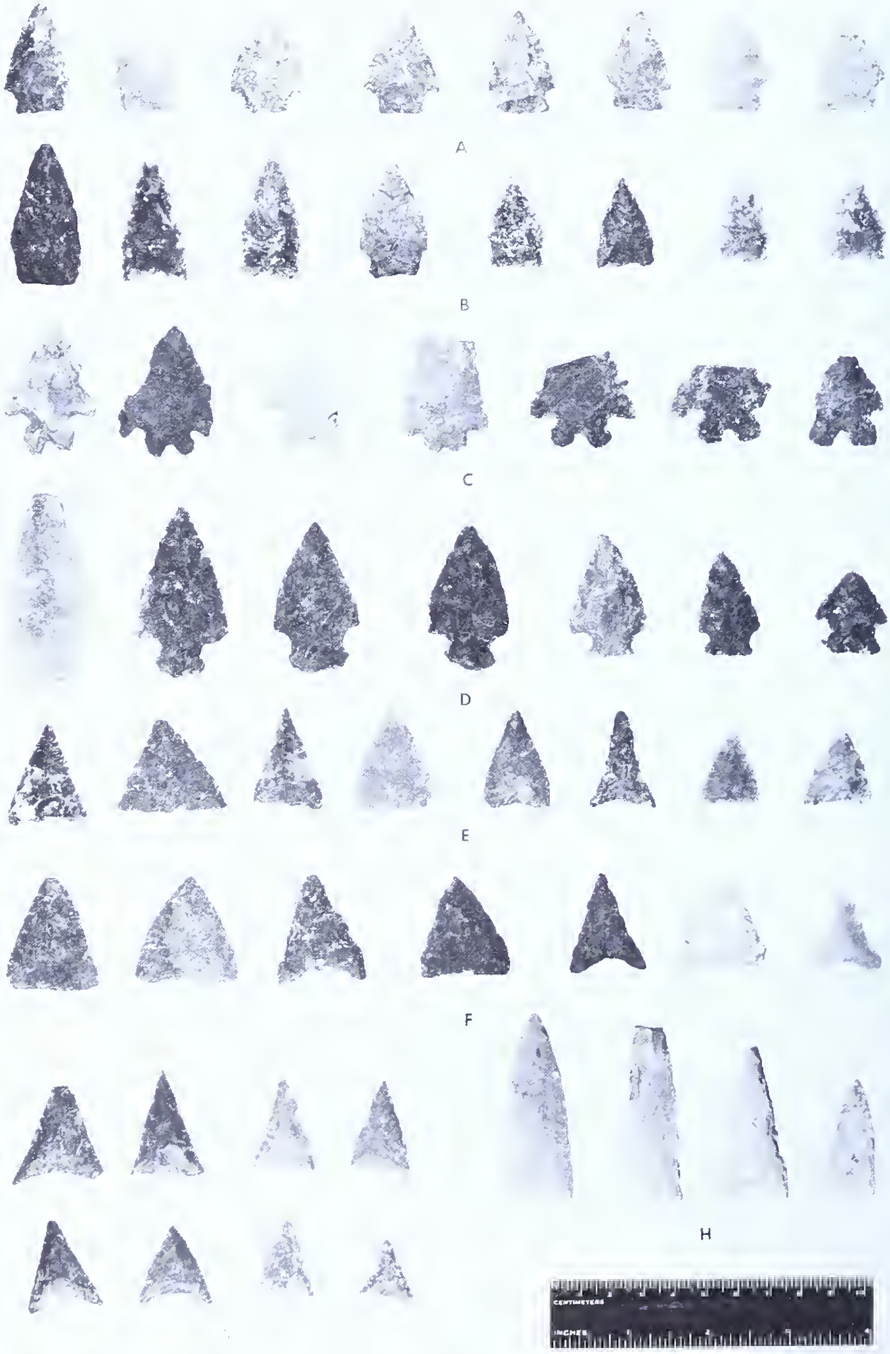


Fig. 121. VARIOUS PROJECTILE POINT TYPES: A, Shriver Expanded Stem points; B, eared points; C, bifurcate-stemmed points; D, generalized side-notched points; E, generalized triangular points; F, Levanna points; G, Madison points; H, elongate triangular points.

An estimated 35 to 45 sites are represented by these groups. It is probably significant that no triangular points were found at the Macpherson hilltop site. Total sample size: 434.

Generalized Triangular (Fig. 121 E)

Description: A variety of small to medium-sized triangular forms is included under this category, with several types present. In size they range in length from 1.5 to .70 inches and in width from 1.18 to .74 inches. In cross section they are generally thin and biconvex, although some are irregular and moderately thick. Forty-six and one-half per cent of the blade edges are straight, 43.3 per cent mildly excurvate, and 10.2 per cent mildly incurvate. Many of the latter have been reshaped. In outline 74.0 per cent are isosceles triangular and 18.5 per cent equilateral or nearly equilateral triangular, while the remainder are indeterminate. Sixty-five per cent have concave bases, with six of these having deeply concave bases. Straight bases occur on 32.5 per cent while only 2.5 per cent (5) have a mildly convex base. Basal grinding is faint when present and is found on 23.6 per cent.

Lithic preference: flint 84.0 per cent (173), chert 9.7 per cent (20), chalcedony (6), jasper (2), argillaceous shale (2), quartzite (1), and argillite (1). Local flints are the overwhelming lithic choice. Total sample size: 205.

Measurements are not provided for this series because they would not be instructive due to the variety of forms represented.

Comments: This is the most common form of the several groups of triangular points. About 30 to 40 sites are represented by these points, and they are found on all sites having Late Woodland components. Probably several types are represented by this group.

Levanna (Fig. 121 F)

Description: These are medium to moderately large triangular points. In cross section a majority is biconvex. A few specimens are fairly thick. Sixty-six and two-tenths per cent of the blade edges are straight, 22.5 per cent excurvate, and 11.6 per cent incurvate. The latter group appears to be reshaped. Fifty-three and one-half per cent are isosceles triangular, 37.3 per cent are equilateral or nearly equilateral triangular, and the remainder are indeterminate. Bases range from rather deeply concave through slightly concave, straight, and slightly convex. Concave bases occur on 84.7 per cent of the specimens, straight on 10.4 per cent, and convex on 4.6 per cent. Basal grinding is present on half of the specimens.

Lithic preference: flint 85.7 per cent (72), chert 9.5 per cent (8), chalcedony (3), and rhyolite (1). Local flints are the overwhelming choice for the production of this type. Total sample size: 84.

	Length (inches)	*Width*	*Thickness*
Range	1.77-1.00	1.41-.95	.32-.20
Average	1.38	1.15	.22

(based upon 10 specimens)

Comments: Generally, Levanna points are larger, thicker, and less finely made than the Madison type. They intergrade with the Madison and generalized triangular forms. Levanna points were named and described by Ritchie (1961: 31). They are widely distributed in the Northeast and in the Middle Atlantic states. In New York they are generally considered as the Owasco point type, ranging in age from about A.D. 900 to 1350. In the Upper Delaware these points have been found in a Late Woodland context at numerous sites. The type is associated with Owasco Series pottery at a number of sites, including the Zimmermann, Manna, Davenport, and Miller Field sites, and about 25 site locations are represented by the collection.

Madison (Fig. 121 G)

Description: These are small to medium-sized triangular points. In cross section they are thin and relatively flat. Eighty-three per cent of the sample have straight blade edges, 11.8 per cent mildly excurvate, and 5.2 per cent incurvate. Several of the latter group were reshaped. In outline, a majority (67.5 per cent) are equilateral triangular or nearly equilateral triangular, 22.2 per cent are isosceles triangular, and the remainder indeterminate. Concave bases are present on 71.7 per cent of the specimens, 25.9 per cent are straight, and three bases are slightly convex. Basal grinding is found on 69.0 per cent.

Lithic preference: flint 82.8 per cent (110), chert 12.0 per cent (16), argillaceous shale (3), chalcedony (3), and quartz (1). Local flints are the overwhelming lithic choice. Total sample size: 133.

	Length (inches)	*Width*	*Thickness*
Range	1.75-.70	1.32-.70	.21-.12
Average	1.32	.87	.17

(based upon 10 specimens)

Comments: This triangular form is a very widespread type and is found throughout most of eastern United States. It is considered Late Woodland or Iroquoian for part of the Northeast (Ritchie 1961: 33). In the Upper Delaware the type has been excavated in a Late

Woodland context at numerous sites. About 25 to 30 site locations are represented by the points of this type in the Macpherson Collection.

Elongate Triangular (Fig. 121 H)

Description: These are narrow and long isosceles triangular points. Blade edges are straight on two specimens and mildly excurvate on three examples. In cross section they are biconvex, with one example having a high medial ridge. Four bases are slightly concave and one is rather deeply concave. Basal grinding is absent.

Lithic preference: argillaceous shale (3) and rhyolite (1). The sample size is too small to suggest lithic preference. Total sample size: 4.

	Length (inches)	*Width*	*Thickness*
Range	2.60-1.50	.91-.63	.31-.20
Average	2.13	.82	.24

(based upon 4 specimens)

Comments: Elongate triangular points occur as minority forms together with other triangular types on Late Woodland sites. In the Upper Delaware Valley the type is uncommon and the collection represents four sites.

MISCELLANEOUS

Included in the miscellaneous classification are two projectile point groups which do not correspond to established types and for which context is uncertain. A generalized side-notched group is recognized to accommodate a variety of side-notched projectile points. Although the broad-stemmed group probably constitutes a type, the context for these is unknown. A third group is a small collection of mostly miscellaneous types. Except for the basal fragment of a Clovis point, a probable Robbins point, and four probable Milanville points (Leslie 1967c: 144-7), these are unnamed types which are listed according to their shape.

Generalized Side-Notched (Fig. 121 D)

Description: This is a broad and varied group of distinctly side-notched points. They range from small to medium and relatively broad-bladed, side-notched points to longer examples with narrower blades. Notches are distinct and small to medium in size. A few examples have large notches. All bases are expanded. Fifty-eight per cent of the bases are straight, 20.7 per cent convex, 7.3 per cent concave, while 15.0 per cent have either a broken base or are unretouched. Shoulders range from acute through right angled to obtuse. Most ears are rounded. Less than half have basal grinding.

Lithic preference: flint 71.6 per cent (107), chert 8.1 per cent (12), shale 5.4 per cent (8), argillite 4.6 per cent (7), argillaceous shale 3.9 per cent (6), chalcedony 3.9 per cent (6), jasper (2), and quartz (1). Local black flints are the strongly preferred lithic material. Total sample size: 149.

	Length (inches)	*Width*	*Thickness*
Range	2.03-1.07	1.20-.60	.36-.20
Average	1.54	.89	.27

(based upon 10 specimens)

Comments: Several type clusters are represented in this group, and it is probable that these range in time from the Late Archaic to Middle Woodland. Very likely some are poor examples of the Brewerton Side-Notched and the Brewerton Corner-Notched types, while others may be rudely made Hopewellian points. Lacking better context, further subdivision would be artificial. This generalized side-notched projectile point form is almost universally distributed in eastern United States. In the Upper Delaware Valley these constitute one of the most common forms, with about 30 to 40 sites represented; similar points have been excavated in Archaic and Woodland components at a number of sites.

Broad-Stemmed (Fig. 118 A, B)

Description: These are rather large lanceolate points with broad stems. Blade edges are excurvate. In cross section they are biconvex. Shoulders are very faint. Stems are broad and almost indistinguishable from the blade. Fifty per cent have a straight base, 44.0 per cent have a mildly concave base, and one base is indeterminate. Ears are pronounced on one example; basal grinding occurs on 56.0 per cent.

Lithic preference is 100.0 per cent argillite. Total sample size: 13.

	Length (inches)	*Width*	*Thickness*
Range	2.82-2.00	1.32-.97	.35-.23
Average	2.51	1.15	.31

(based upon 7 specimens)

Comments: This form can be said to resemble Steubenville Stemmed, which was recognized and named by Mayer-Oakes and ascribed to the Panhandle Archaic. On typological grounds it was thought to be early in the Archaic (Mayer-Oakes 1955a: 207-9; 1955b: 19). The East Steubenville shell heap, Brooks County, West Virginia, which contained Steubenville points, is radiocarbon dated at 2279 B.C. ± 500 years, which places the type in the Late Archaic (Crane and Griffin 1958: 1119). Ritchie (1961: 51-2) described Steubenville points and suggested that they are associated with early pottery. More recently he has indicated that, on the basis of Funk's work at the Westheimer site along Fox Creek, there is a similar Middle Woodland type which dates A.D. 360 to A.D. 450. Funk and Ritchie have decided to use the term Fox Creek to refer to these points (Ritchie January 23, 1966: personal correspondence).

The broad-stemmed form is widespread in the Northeast, extending from West Virginia and Ohio to New York, Pennsylvania, and New Jersey. The type is also found at the Accokeek Creek site on the Potomac (Stephenson 1963: 140-1). In the Upper Delaware the form is not common. Well-made points of this style fashioned from Onondaga chert were found in the Adena-Middlesex component at the Rosenkrans cemetery site (Carpenter 1950: 298; Fig. 89 n, r). Werner reports that three broad-stemmed specimens and one lanceolate type were found in an Archaic to Early Woodland context at the Zierdt site. Nine broad-stemmed examples and two knives were excavated at the Manna site, where they were associated with a grit-tempered Fabric-Impressed vessel (Werner March 19, 1969: personal correspondence). Broad-stemmed points are found on about 10 sites and the occurrence is noted (as Steubenville) by Leslie (1963b: 87-8). In the lower Delaware the frequency of this form is greater, while in the Susquehanna Valley the type is present but scattered.

The literature is contradictory. Dragoo (1959: 210) and Stephenson (1963: 176-7) call it an Archaic type, while Ritchie suggests that it is Middle Woodland. It is apparent that more than one type is represented. On a typological basis I would offer the suggestion that these argillite Upper Delaware Valley broad-stemmed points are related to the Lagoon point. Without more information and better context, it is impossible to determine the cultural position of these projectile points for this area.

Miscellaneous

Possible Clovis (basal fragment)	1
Possible unfinished fluted point	1
Robbins (probable)	1
Milanville (probable)	4
Teardrop-Shaped	6
Indented Base	6
Small Straight Stemmed	8
Broad Expanded Stem	3

Broad Spade-Shaped Blade	3
Side-Notched Long Narrow Blade	3
Corner-Notched Broad Blade	1
Deeply Corner-Notched	1
Total	38

Unclassified

Not included in this analysis of the Macpherson Collection are 832 non-diagnostic blanks and 310 broken or fragmentary projectile points, knives, and bifacially chipped specimens.

Table 13. Frequency of projectile point types in the Macpherson Collection.

ARCHAIC		
Laurentian Tradition	*Number of Specimens*	*Percentage*
Vosburg	84	4.2
Brewerton Side-Notched	57	2.9
Brewerton Corner-Notched	48	2.4
Brewerton Eared-Triangular	25	1.3
Brewerton Eared-Notched	10	0.5
Otter Creek	10	0.5
Total	234	11.8
Piedmont Tradition		
Delaware Valley Archaic Complex		
Lackawaxen Stemmed		
Subtype 1 Expanded Stem	97	4.9
Subtype 2 Straight Stem	91	4.6
Subtype 3 Converging Stem	47	2.3
Subtotal	235	11.8
Macpherson	54	2.8
Egypt Mills	10	0.5
Total	299	15.7
Northern Piedmont		
Normanskill	29	1.5
Normanskill-like	67	3.4
Lamoka-like	142	7.2
Total	238	12.1
Other Archaic		
Eshback	14	0.7
Shriver Expanded Stem	54	2.7
Eared	46	2.3
Lamoka	18	0.9
Bifurcate Stemmed	18	0.9
Total	150	7.5

Broadspear Tradition		
Lehigh/Koens-Crispin (including 13 Savannah River Stemmed-like	41	2.1
Perkiomen	37	1.7
Susquehanna	1	0.1
Total	79	3.9
LATE ARCHAIC TO EARLY WOODLAND		
Fishtail Tradition		
Dry Brook	38	1.9
Orient	158	8.0
Total	196	9.9
EARLY WOODLAND		
Meadowood	12	0.6
MIDDLE WOODLAND		
Rossville	113	5.8
Lagoon	15	0.8
Jack's Reef Corner-Notched	8	0.4
Jack's Reef Pentagonal	7	0.3
Total	143	7.3
LATE WOODLAND		
Generalized Triangular	205	10.4
Levanna	84	4.3
Madison	133	6.7
Elongate Triangular	4	0.2
Total	426	21.6
Others		
Generalized Side-Notched	149	7.5
Broad-Stemmed	13	0.7
Miscellaneous	38	1.9
Total	200	10.1
Grand Total	1,977	100.0

OTHER STONE TOOLS

In addition to projectile points, the Macpherson Collection includes a substantial quantity and variety of stone tools. Some of these, such as the Perkiomen drills and scrapers, are diagnostic traits. Other items are non-diagnostic forms which may be traits common to many diverse cultures. The more distinctive and diagnostic artifacts are tabulated according to quantity, together with the estimated number of sites from which these pieces were collected. Less diagnostic artifacts such as milling stones, mullers, pestles, netsinkers, etc., are present in the collection, but they are of a general nature and their inclusion here seems unnecessary since the original context for these items is unknown. Site data are available for almost all artifacts, although it is not instructive to associate these tools with specific projectile point types because most of the fields wherein Macpherson made his collection yielded a variety of projectile point types.

Chipped Stone

Item	*Number*	*Estimated Number of Sites*
Drills/Reamers		
Expanded base	20	8
Perkiomen (cruciform)	9	6
Fishtail	9	5
"T"-Shaped	4	4
Tapered	4	3
Crescent-Shaped Base	3	3
Broad Stemmed	1	1
Miscellaneous	4	4
Tip (fragments)	9	6
Total	63	18
Scrapers		
Side-Notched	11	5
Perkiomen (crescent-shaped edge)	5	2
Fishtail	4	3
Basally-Notched	1	1
Broad-Stemmed	1	1
Small Ovate	1	1
Keeled	1	1
Flake	40	12
Biface	25	9
Large Crescent-Shaped (knives?)	4	3
Total	93	17
Large Side-Notched Knives	16	11
Flakes Utilized as Knives	24	9
Flake Utilized as a Spokeshave	1	1
Graver	1	1

Ground Stone

Spearthrower Weights		
Oval	12	10
Winged	4	4
Notched	2	2
Total	18	13

Gorgets	10	5
Pendants	4	3
Gorgets and/or Pendants (fragmentary)	9	7
Celts	8	5
Grooved Axes	5	5
Bola Stones	18	7
Large Grooved Stones	8	4
Steatite Bowl Fragments	18	7
Steatite Beads	4	2
Ground Knives	4	1
Straight Base Platform Pipe	1	1
Stone Whorl	1	1

Some of these tools merit additional comment.

Perkiomen Drills and Scrapers

These are distinctive tools fashioned from the projectile point form of this type. The cruciform shape of the drill or reamer and the wide crescent-shaped working edge of the scraper result from the reshaping of the broadspear. Fishtail drills and scrapers are also made from projectile point forms and are easily identified by the shape of the stem.

Large Side-Notched Knives

Description: These are large, thick, side-notched forms which probably represent knives or projectile points used as knives. In cross section most are biconvex, while two specimens are flat and thin. Six are very thick in cross section. Notches are large and bases are expanded. Eight have straight blade edges, five convex, and three mildly concave. Eleven have convex bases and five have straight bases. Basal grinding occurs on less than half, and when present it is light.

Lithic preference: flint 37.5 per cent (6), argillite (3), chert (3), chalcedony (1), jasper (1), quartzite (1), and siltstone (1). Lithic preference tends to be local flint. Total sample size: 16.

	Length (inches)	*Width*	*Thickness*
Range	3.87-2.15	1.62-1.27	.57-.32
Average	2.82	1.44	.41

(based upon 10 specimens)

Comments: These are probably Late Archaic Laurentian knife forms. They are not common in the Upper Delaware and are known from about 11 sites. The form is present at the Zierdt site.

Platform Pipe (Fig. 122)

A straight-based platform pipe was found on the Rosenkrans Ferry site, Sussex County, New Jersey. This was where Cross (1941: 132-3)

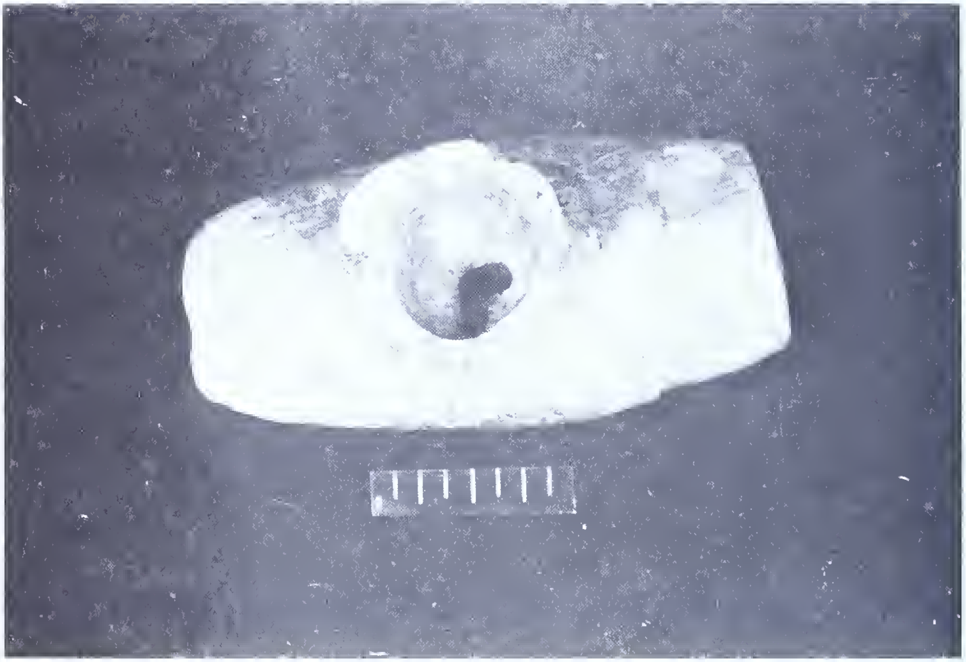


Fig. 122. PLATFORM PIPE FROM THE ROSENKRANS FERRY SITE.

conducted a series of test excavations in 1938 and where Lewis M. Haggerty dug in 1941, 1947, and 1949. Apparently at a site nearby, Charles A. Philhower found a Point Peninsula component which included fragments of a classical late Point Peninsula comb, calcined bone, two perforated shark's teeth, and a portion of a straight-based platform pipe of steatite (Carpenter 1950: 313).

The pipe from the Macpherson Collection is made of anhydrite ($CaSO_4$), which is anhydrous gypsum. This is a non-local material which is likely to be found in caves of Virginia and the Ohio Valley. The cultural associations for the Macpherson pipe are late Point Peninsula.

Appendix

POTTERY TYPES

IN BROAD terms the pottery of the Upper Delaware Valley has been subdivided into seven series: Steatite-Tempered, Early Series, Point Peninsula, Clemson Island, Owasco, Intermediate, and Tribal. Several pottery types do not conform to these series, and these are described under the heading "Others."

STEATITE-TEMPERED

Marcey Creek Plain (not illustrated)

Description: Crushed steatite occurs in large quantities in the clay matrix. The amount of steatite used as temper varies considerably, and in some instances there is as much steatite as clay. Vessel form is subrectangular to circular, with straight sides converging slightly toward a flat bottom. Lips are rounded, Subrectangular lugs, which are copies of the lug handles on steatite bowls, occur on opposite sides of the vessel.

Remarks: Steatite-tempered pottery is the earliest fired ware in the Middle Atlantic region. It is closely linked to the steatite bowl components of the area and at some sites it is coeval with stone bowls. Steatite-tempered pottery is never abundant. Within the family of steatite-tempered pottery there are variations of form and attempts at decoration. Crude lip incising, notching, and cord-markings are sometimes present, while some basal sherds bear mat impressions. These impressions are not an attempt at embellishment, but are caused by the placement of the vessel on a woven mat while the clay is still pliable.

Temporal Position: Very Late Archaic to Early Woodland. The type is usually associated with the early fishtail projectile point tradition. At the Miller Field site the type is apparently associated with an early Orient component which is radiocarbon dated to 1220 B.C. ± 120 years.

Distribution: Piedmont and Coastal Plain of the Middle Atlantic area. In the middle Delaware Valley the type is reported from the Abbott Farm site, and in southern New Jersey it is found at the Ware and Raccoon Point sites. It has been reported and described

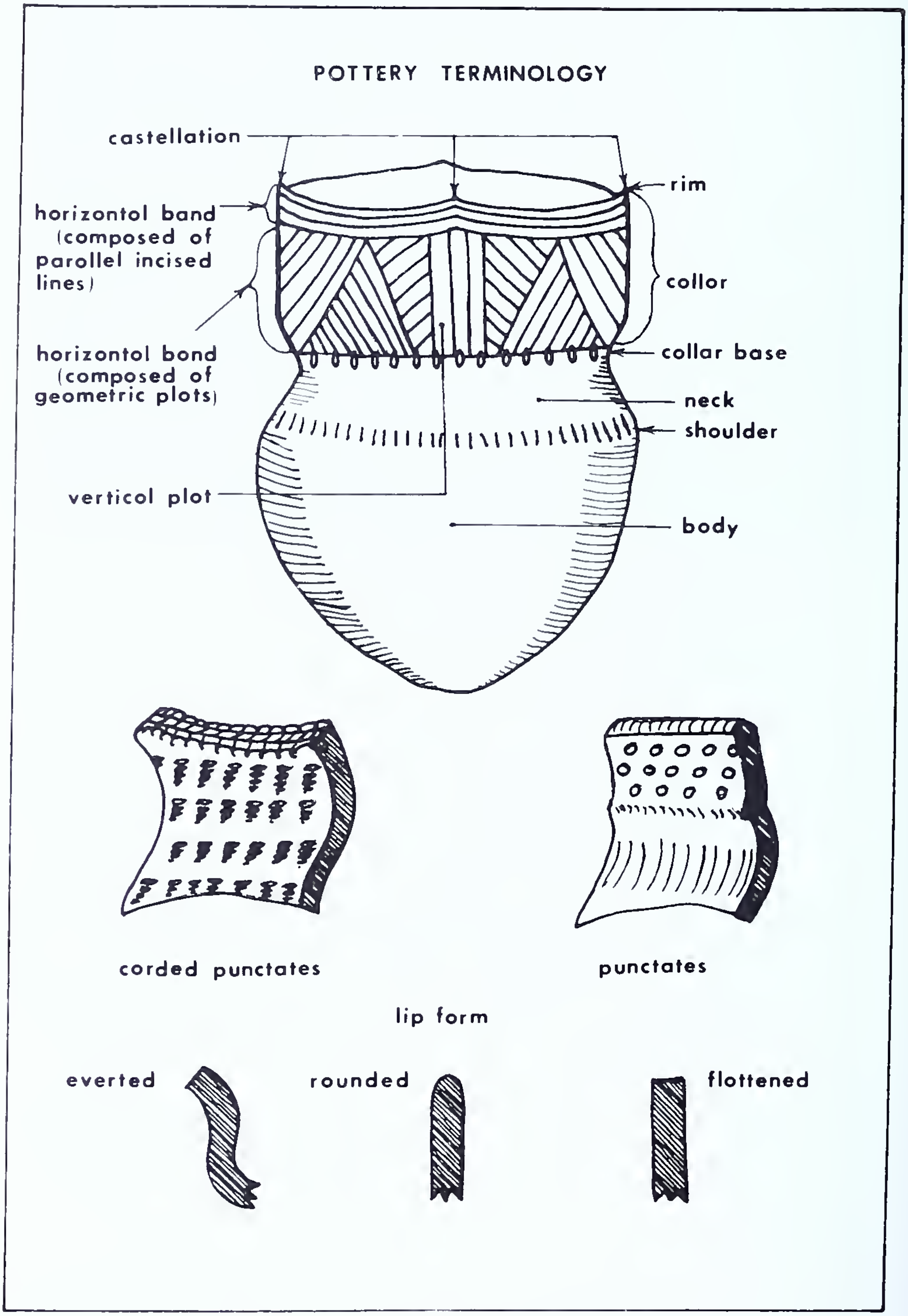


Fig. 123. POTTERY TERMINOLOGY.

for tidewater Maryland and Virginia and the lower Susquehanna. In the Susquehanna Valley the distribution of steatite-tempered pottery is spotty, but it is present at the Wilson site and the type has a sporadic occurrence in central New York. In the Upper Delaware Valley the type is found at the Miller Field site.

References: Slattery (1946: 262-6), Manson (1948: 223-7), McCann (1950: 321; 1962: 53-4), Evans (1955: 54-7), Cross (1956: 175), Kier and Calverly (1957: 86-8), Kinsey (1959b: 127), Stephenson (1963: 89-92).

Early Series

The term Early Series is used for this group since I have included types other than those designated as Point Peninsula by Ritchie and MacNeish (1949: 100-7). This pottery is generally thick walled with rather large pieces of crushed quartz and grit used as temper. It is largely undecorated, and surface treatment is cord-marked, net-impressed, or dentate-stamped. Only in the case of the latter does surface treatment take the form of decoration.

Although sherds are small, vessel shape appears to be fairly straight sided with a conoidal base. Slight neck constrictions occur on the net-marked and on some of the wiped pottery. Lips are generally smoothed and rounded, although some cord-marked wares have a flattened lip.

A diagnostic trait of the Early Series is that breaks occur along the coil or fillet contact. This contrasts with later pottery, which lacks visible coil or fillet contacts and which apparently was shaped from a mass of clay by the paddle-and-anvil technique.

Vinette 1 (Fig. 28, Nos. 1-6; 48 E)

Description: This is a coarse and fairly thick (.40 of an inch on the average) ware. It contains large quantities of coarse to fine pieces of quartz and flint, both natural and crushed, as temper. Vessel form is straight sided with a conoidal base. The upper rim edge may be slightly thinned. Lips are rounded with the cord markings smoothed and obliterated. Moderately coarse cord markings overlap, although they tend to be vertical on the exterior surface and horizontal on the interior wall. One rim sherd from the Faucett site is from a vessel with a calculated diameter of six to seven inches.

Variations in the local Vinette 1 pottery occur in the form of tooling marks applied over the corded surface, the coarseness and the twist of the cordage employed to produce the markings, the temper, and the lip treatment.

Remarks: Vinette 1 and several closely related forms belong to a family of interior/exterior cord-marked pottery. The type is widely distributed in the Northeast, but it is usually not abundant. Cross describes four varieties of cord-marked pottery for the Abbott Farm site near Trenton, New Jersey, and Michels and Smith refer to a form of this type as Juniata Thick. The type is apparently related to the thick and heavy corded wares of the Ohio Valley.

Temporal Position: Early Woodland. Possibly the type is associated with an Orient component at the Zimmermann site, and at the Faucett site it appears to be associated with the Bushkill complex.

Distribution: Northeast, including New England and Ontario. In the Upper Delaware Valley the type is fairly common and is found at Zimmermann, McCann, Davenport, Miller Field, Brodhead-Heller, Faucett, Peters-Albrecht (36-Pi-21), Brodhead, Camp Ministerium, Friedman II, Van Campen's Woods, and Tocks Island sites.

References: Ritchie and MacNeish (1949: 100), Cross (1956: 131-5), Lopez (1957: 24-5), Kinsey (1958: 1-3; 1959b: 124-5), Lucy (1959: 30), Michels and Smith (1967: 468), Salwen (1968: 325-6).

Exterior Corded/Interior Smoothed (Figs. 28, Nos. 7-9; 29, No. 4; 48 F)

Description: This type is related to Vinette 1 but is less coarse and more compact. Generally its walls are thinner, with sherd thickness ranging from .25 to .40 of an inch and averaging about .32 of an inch. Color varies from a light sandy tan to darker grays and blacks. Angular pieces of quartz are used as temper, but the fragments tend to be of a smaller size and they occur in less quantity than in Vinette 1. Vessel form is probably similar to Vinette 1, although the sherds are not sufficiently large to determine precise shape. Lips are roughly flattened or crudely rounded. No decoration is present.

Cord markings occur over the exterior surface and are similar in character to those on Vinette 1 pottery, although they are not present on the interior surface. Some sherds show tooling or tool work over the cord impressions. One rim sherd from the Faucett site is from a vessel with a calculated diameter of eight to nine inches.

Within this ware a variant form occurs at the Zimmermann site, where a group of sherds is referred to as redware. Their color is a reddish tan on the exterior and darker brown on the interior with a few sherds entirely reddish orange. This variant is also distinguished by shape and thickness of the vessel walls. Partial reconstruction of one vessel suggests a conoidal base, while the rim is incurvate. Mouth diameter is an estimated 10 inches, while body diameter is about 11 to 12 inches. Sherd thickness (excluding basal sherds) ranges from .25 to .31 of an inch. The cord impressions are broad and are generally applied in an oblique fashion to the exterior surface. Interior surfaces are smooth. Lips are flat and corded. Another group termed buffware has the same overall characteristics of the redware except for the color. Buffware has a buff-colored exterior and interior while the core is gray. On some sherds the interior surface is gray.

Remarks: The type belongs to a large pottery group having exterior cord markings and smooth interiors, including thin Paddled Cord (Cross 1956: 134-5), Modified Interior Cord-Marked (Lopez 1957: 25; Salwen 1968: 326), Geneseo Cord-Marked (Ritchie and MacNeish 1949: 121), Juniata Thick (Interior Smooth, variant), and Sheep Rock Corded (Michels and Smith 1967: 469-71). A related pottery type was found associated with a Meadowood component at the Leibhart site in York County, Pennsylvania.

Temporal Position: Early Woodland. At the Faucett site this type may be associated with a late Orient component which is radiocarbon dated to 810 B.C ± 100 years, or possibly with the Meadowood component. At the Zimmermann site a redware variant of this pottery may be associated with both a late Orient component and a Meadowood component.

Distribution: Spotty in western and central New York, coastal New York, lower Delaware Valley, lower Susquehanna Valley, and Juniata Valley. In the Upper Delaware Valley the type is found at the Zimmermann, McCann, Brodhead-Heller, Faucett, Brodhead, Peters-Albrecht (36-Pi-21), Miller River, Hartwick, and Miller Field sites.

References: Ritchie and MacNeish (1949: 121), Cross (1956: 134-5), Lopez (1957: 25), Michels and Smith (1967: 469-71) and Salwen (1968: 326).

Brodhead Net-Marked (new type name) (Figs. 48 A; 81; 82)

Description: Medium to fine pieces of angular quartz with some minor amounts of chert are used as temper in varying quantities. Larger fragments of temper are sometimes lost as a result of weathering. Color varies from a light grayish tan exterior to a slightly darker gray interior surface. In cross section the core may be a darker charcoal gray which is the result of being poorly fired. Thickness ranges from .27 to .50 of an inch, with the average about .40 of an inch. In form the neck is slightly constricted. The lip is smoothed, mildly everted, and irregularly rounded. The base is conoidal.

Net markings occur over the entire exterior and most of the interior surfaces, although they do not reach to the bottom on the interior. No decoration is present except for the net-markings, which doubtlessly are produced by the method of construction. Possibly the net-markings were applied by means of a net-wrapped paddle, although they infrequently overlap. Some are intentionally obliterated by smoothing, while others are obscured by weathering. A partly reconstructed net-marked vessel (Fig. 82) from the Brodhead site has a calculated rim diameter of 11 to 12 inches, and a rim sherd from the Faucett site is from a vessel with a calculated diameter of 9 to 10 inches.

Remarks: The type is probably related to North Beach Net-Marked from coastal New York (Smith 1950: 196; Salwen 1968: 326). Cross (1956: 139-40) found a considerable quantity of net-marked pottery at the Abbott Farm site. In fact, there may be as many as five variations of net-marked pottery present in the extensive ceramic collection of the New Jersey State Museum from this site. Net-marked pottery is fairly common to the coastal and eastern portions of the Piedmont in the Middle Atlantic states. Other net-impressed wares are reported for tidewater Maryland and Virginia, namely, Pope's Creek, Albemarle, and Mockley (Stephenson 1963: 94-5, 102-3, 107-8).

Temporal Position: Early to Middle Woodland. At the Faucett and Brodhead sites it is the majority pottery type of the Bushkill complex. At the Miller Field site several sherds of the type were near a hearth that radiocarbon dated to 480 B.C. ± 80 years. (See page 38.)

Distribution: Middle Atlantic coastal plain. In the Upper Delaware Valley the type is found at the Brodhead, Faucett, Peters-Albrecht (36-Pi-21), and Miller Field sites.

References: Smith (1950: 196), Cross (1956: 139), Stephenson (1963: 94-5, 102-3, 107-8), Salwen (1968: 326).

Wiped (Figs. 28, No. 12; 48 B; 85 D)

Description: This is a plain, fairly compact ware with a dull orange tan to grayish exterior, with the interior surface color slightly darker. Thickness ranges from .30 to .45 of an inch. Temper is large to fine pieces of natural quartz in moderate to large amounts. Most sherds are small and show only a slight curvature, but at least one sherd is from a vessel with a mildly everted upper rim area. In other instances the upper rim area is straight. Lips are rounded and smoothed.

Both interior and exterior surfaces have been wiped or scraped smooth. The former has been wiped harder, since parallel and diagonal wiping marks are deeper and more clearly visible. Fine striations are present in some of the troughs made by the wiping process. Salwen (1968: 328) has suggested that wild grasses might have been the material used as the wiping or rubbing agent. One rim sherd from the Faucett site is from a vessel with a calculated diameter of eight to nine inches.

Remarks: This resembles pottery from the Abbott Farm site described as Plain by Cross (1956: 140-2) and the type from the Muskeeta Cove site, Long Island, described by Salwen (1968: 328-9) as Wiped Exterior/Smooth Interior.

Temporal Position: Probably Middle Woodland.

Distribution: Atlantic coastal plain from New Jersey to Long Island. In the Upper Delaware Valley the type is found at the Faucett, McCann, Brodhead, and Zimmermann sites.

References: Cross (1956: 140-2), Salwen (1968: 328-9).

Fabric-Impressed (Fig. 48 C)

Description: Paste characteristics and temper are similar to the Wiped pottery. Surface colors are a tan brown with a charcoal-gray core. Temper is large to fine pieces of naturally rounded quartz and grit in rather small quantities. Thickness ranges from .32 to .44 of an inch. Vessel form is unknown. A single rim sherd is thinned and flattened. Exterior surface treatment appears to be overall fabric impressions, with the interior surface smoothed by wiping or scraping. The fabric impressions may have been applied by malleating the surface with a paddle wrapped with fabric.

Remarks: Probably this type is related to one of the Middle Atlantic fabric-impressed wares such as Riggins, Abbott, Albemarle, or Rappahannock. The small size of the sherds prevents closer comparison with these wares.

Temporal Position: Probably Middle to Late Woodland.

Distribution: Southern New Jersey to tidewater Virginia. In the Upper Delaware Valley the type is found at the McCann, Brodhead, Peters-Albrecht (36-Pi-21), Brodhead-Heller, and Faucett sites.

References: Cross (1956: 150-1), Stephenson (1963: 103, 110-2).

Dentate-Stamped (Figs. 28, Nos. 10, 11; 48 D)

Description: Temper is mostly moderate amounts of small natural pieces of quartz and mica, although some larger fragments are present. The exterior color varies from light tan through dull orange-grays and charcoal to a darker interior surface, and the core is charcoal gray. Thickness ranges from .25 to .42 of an inch with the average about .32 of an inch. Interior and exterior surfaces are wiped or rubbed smooth. Rims are thinned, rounded, and notched. Light incising is present on the upper interior rim area of one rim sherd. Vessel shape is undetermined.

Decoration takes the form of dentate stamping. On a majority of sherds the stamping consists of parallel and diagonal lines of shallow impressions. The tool used to produce these impressions is unknown, but it appears to have been an implement having blunt and rectangular teeth placed at regular intervals. On one variety two rows of a zigzag or a V-shaped pattern of dentate stamping are present near the rim. Sides of the V are 1⅛ inches long. Four sherds from the Faucett site have fine-tooth dentate stamping in an oval or curvilinear pattern in combination with a chevron design. A rim sherd from the Faucett site has a calculated rim diameter of about five inches.

Remarks: The type is similar or closely related to Clearview Stamped from coastal New York (Smith 1950: 195; Salwen 1968: 326-8), Vinette Dentate (Ritchie and MacNeish 1949: 100-2), and Abbott Dentate from the lower Delaware Valley (Cross 1956: 147). Curvilinear dentate patterns are rare, although their distribution and significance in the Northeast is discussed by Lopez (1958a: 3-10). The latter speculates that the motif is the result of influences diffused from the Hopewell culture centers to the west.

Temporal Position: Middle Woodland.

Distribution: Middle to northern Atlantic coastal plain. Other forms are widely distributed throughout New York and Ontario. In the Upper Delaware Valley the type is found at the Zimmermann, McCann, Brodhead-Heller, Faucett, Pahaquarra, and Peters-Albrecht (36-Pi-21) sites.

References: Ritchie and MacNeish (1949: 100-2), Smith (1950: 195), Cross (1956: 147-8), Lopez (1958a: 3-10), Salwen (1968: 326-8).

POINT PENINSULA

Middle and Late Point Peninsula pottery is distinguished from the Early Series by shape, decoration, and thickness. Coil or fillet contacts are not as easily discernible. Temper may be crushed quartz and/or micaceous grit. At Kipp Island No. 2 in central New York, the pottery is radiocarbon dated to A.D. 310 ± 100 years, and at Kipp Island No. 3 to A.D. 630 ± 100 years (Ritchie 1965a: 228).

Point Peninsula Rocker-Stamped (Fig. 85 H)

Diagnostic Features: Curved rocker stamping is applied obliquely to the exterior surface. The impressions are blunt and vary in size. Short incising occurs on the upper rim edge. Fairly shallow crescent-shaped punctates and faint parallel rows of stamped impressions occur on the otherwise smooth interior.

Temporal Position: Middle Woodland.

Distribution: Upper New York, eastern Ontario, and Maine. In the Upper Delaware Valley the type is found at the Peters-Albrecht (36-Pi-21) site.

Reference: Ritchie and MacNeish (1949: 102-3).

Point Peninsula Corded (Fig. 29, No. 1)

Diagnostic Features: Horizontal and/or oblique cord impressions encircling an everted rim.

Temporal Position: Middle Woodland.

Distribution: Eastern Canada and upper New York. In the Upper Delaware Valley the type is found at the Zimmermann, Manna, and Davenport sites.

Reference: Ritchie and MacNeish (1949: 102).

Jack's Reef Corded Punctate (Fig. 32, No. 8)

Diagnostic Features: Decoration consists of triangular plats formed by punctates on the rim and neck. The punctates are made with a paddle corner or a stick. Apexes of the triangular plats point downward. Oblique corded impressions occur on the flattened lip.

Temporal Position: Late Middle Woodland.

Distribution: Central New York. In the Upper Delaware Valley the type is found at the Zimmermann site.

Reference: Ritchie and MacNeish (1949: 107).

Jack's Reef Corded (Fig. 28, No. 14)

Diagnostic Features: Cord-wrapped stick decorations on the lip and the interior rim. Rims are everted.

Temporal Position: Late Middle Woodland.

Distribution: Central New York and eastern Ontario. In the Upper Delaware Valley the type is found at the Zimmermann and Manna sites.

Reference: Ritchie and MacNeish (1949: 106).

CLEMSON ISLAND

Clemson Island (Fig. 28, No. 17)

Description: This type may be either cord-marked or fabric-impressed. Sherds from one vessel are decorated with horizontal and oblique corded impressions on the neck. The lip is flattened and decorated with crisscrossed cord impressions. A variant form has a scalloped lip. Sherds from this vessel are decorated with complicated plats consisting of small oval punctates outlined with paddle-edged markings. Deep rounded punctations are sometimes used to decorate the rim. Colors are bright red to gray. Temper is medium-sized crushed quartz or chert.

Remarks: Clemson Island is a poorly understood pottery type, and it is often difficult to distinguish sherds of this type from early Owasco pottery. Michels and Smith (1967: 471-5) recognize as many as four possible Clemson Island types.

Temporal Position: Early Late Woodland. Two radiocarbon dates from a feature which yielded this pottery at the Wells site, Bradford County, are A.D. 980 ± 100 years and A.D. 1070 ± 100 years (McCann February 6, 1969: personal correspondence).

Distribution: Susquehanna and Juniata valleys. In the Upper Delaware Valley the type is found at the Zimmermann, Manna, and Miller Field sites.

References: Jones (1931: 95-6), Lucy (1959: 31-2), Michels and Smith (1967: 471-5).

OWASCO SERIES

The Owasco Series is characterized by horizontal corded decorative motifs on low collars or on collarless vessels. On the latter, lips may be everted. Both vessel forms are decorated with cord impressions. These may occur on the neck, collar, or shoulder in the form of corded herringbones in vertical or horizontal plats. Cord-wrapped stick and fingernail impressions may be present. Finely crushed chert, quartz, granitic rock, and minor amounts of mica are used as temper. Shapes are globular to elongate with a conoidal base. Early types are collarless, while later types have low to medium-high collars. The exterior surface is generally cord-marked and the interior is smooth. There are occasional instances of check-stamping and possible examples of thong-marking.

The earliest New York Owasco date is A.D. 1070 ± 60 years from the Roundtop site; this site also yielded good evidence for corn, bean, and squash agriculture (Ritchie 1969a: xxv-vi). This date is closely followed by two similar radiocarbon dates from the Maxon-Derby site, A.D. 1100 ± 150 years and A.D. 1100 ± 100 years. An average of four middle Owasco radiocarbon dates from the Sackett, Snell, O'Neil, and Bates sites is A.D. 1161 ± 142 years. Two late Owasco radiocarbon dates from the Castle Creek site are considered less reliable. The postulated time span for this late Owasco period is A.D. 1200 to 1300 (Ritchie 1965a: 273-4).

No attempt is made to describe the full range of decorative nuances that occurs within the local Owasco Series.

Wickham Corded Punctate (Fig. 109)

Diagnostic Features: A row of punctates encircles the rim. Short oblique cord-wrapped stick impressions may occur between the punctation and the lip. Rim interiors and lips are often corded.

Temporal Position: Early Owasco, about A.D. 1000 to 1100.

Distribution: Central New York and upper Susquehanna Valley. In the Upper Delaware Valley the type is found at the Zimmermann and Manna sites.

Remarks: This type is related to, and difficult to distinguish from, Clemson Island pottery.

Reference: Ritchie and MacNeish (1949: 107-8) and Lucy (1959: 30-2).

Carpenter Brook Cord-on-Cord (Figs. 28, Nos. 13, 15, 16; 85 B)

Diagnostic Features: Oblique, herringbone, and platted cord-wrapped stick decorations occur on an everted rim. These are applied over a cord-marked surface.

Temporal Position: Early Owasco, about A.D. 1000 to 1100.

Distribution: Much of New York, part of lower Ontario, middle and upper Susquehanna Valley, Juniata Valley, and northwestern New Jersey. In the Upper Delaware Valley the type is found at the Zimmermann and Manna sites.

References: Ritchie and MacNeish (1949: 108), Lucy (1959: 32), Michels and Smith (1967: 478-9).

Levanna Cord-on-Cord (Figs. 28, No. 19; 35, No. 1; 37, No. 11)

Diagnostic Features: The entire exterior surface is cord-marked. When decoration is present it consists of corded impressions on the lip of an everted rim.

Temporal Position: Early Owasco continuing to Late Owasco, about A.D. 1100 to 1300.

Distribution: Spotty in New York, northern New Jersey, and the Juniata Valley, with some similar forms occurring in the Susquehanna Valley. In the Upper Delaware Valley the type is found at the Zimmermann and Manna sites.

References: Ritchie and MacNeish (1949: 110), Lucy (1959: 32), Michels and Smith (1967: 479-80).

Sackett Corded (Figs. 10 B; 28, No. 18; 35, No. 3; 37, Nos. 6, 7, 10; 43 L, S; 45 D; 85 A)

Diagnostic Features: Horizontal, oblique, vertical, and herringbone motifs composed of cord impressions occur on the smooth neck of collarless vessels. Rims are everted. A variant form has an incipient, low rounded collar.

Remarks: This type is defined by Lenig, and results from combining Owasco Corded Horizontal, Owasco Herringbone, Owasco Platted, and Owasco Corded Oblique types, as defined by Ritchie and MacNeish. The type is ancestral to Kelso Corded.

Temporal Position: Early to Late Owasco. The Sackett site in central New York is radiocarbon dated to A.D. 1140 ± 150 years (Ritchie 1965a: 274). In the Upper Delaware, Owasco Herringbone was found in Feature B-F 45, Miller Field site, and charcoal from this feature yielded a radiocarbon date of A.D. 1190 ± 100 years.

Distribution: Widely distributed throughout New York, eastern Ontario, northeastern Pennsylvania, the Juniata Valley, and northern New Jersey. In the Upper Delaware Valley the type is fairly common, and it is found at the Davenport, Zimmermann, Manna, Miller Field, Bell-Philhower, Brodhead-Heller, Brodhead, and McCann sites.

References: Ritchie and MacNeish (1949: 110-2), Lucy (1959: 32-4), Lenig (1965: 6), Michels and Smith (1967: 475-8).

Owasco Corded Punctate—Variant (Fig. 85 M)

Diagnostic Features: Corded punctates are used as the decorative technique. A row of oblique corded punctates occurs on the rim, and vertical plats of horizontal punctates are present on the neck. The area between the plats is filled with oblique corded punctates, and a horizontal row of the latter elements occurs on the shoulder. Incipient castellations are present. The lip is everted and decorated with corded punctates. Finely crushed quartz is used as temper.

Remarks: A large sherd of this type has a rim diameter of about six and a half inches.

Temporal Position: Possibly Middle Owasco, about A.D. 1100 to 1200.
Distribution: Brodhead-Heller site. Owasco pottery done in this technique occurs at McCann Camp Ministerium, Miller Field, and Bell-Philhower sites.

Castle Creek Punctate (Figs. 10 A; 37, Nos. 4, 18)
Diagnostic Features: Horizontal rows of punctates occur on the collar, and incised, punctated, or corded decorations may be present on the neck.
Temporal Position: Middle to Late Owasco, about A.D. 1200 to 1300.
Distribution: Central New York and the upper Susquehanna Valley. In the Upper Delaware Valley the type is found at the Zimmermann, Manna, and possibly Bell-Philhower sites.
References: Ritchie and MacNeish (1949: 110), Lucy (1959: 34).

Castle Creek Incised Neck (Fig. 37, Nos. 2, 5)
Diagnostic Features: Rudely incised oblique, parallel lines on the neck form open triangles. One or two bands of oblique punctates occur on the rim.
Temporal Position: Late Owasco, about A.D. 1200 to 1300.
Distribution: Central New York and the Juniata Valley. In the Upper Delaware Valley the type is found at the Zimmermann and Manna sites.
References: Ritchie and MacNeish (1949: 114-5), Michels and Smith (1967: 480).

Castle Creek Corded Neck—Variant (Fig. 37, No. 14)
Diagnostic Features: This form is similar to Castle Creek Incised Neck except that corded impressions are used in place of incising.
Temporal Position: Late Owasco, A.D. 1200 to 1300.
Distribution: Zimmermann and Munsee Cemetery sites.

Kelso Corded (Figs. 10 C, F; 11 E; 32, No. 3; 37, Nos. 1, 12, 13, 16; 38, No. 2; 43 I, T; 44 D; 45 E; 49 j, k; 74 C; 85 K)
Description: Horizontal rows of corded impressions occur on a low to medium-high collar. There may be as many as nine rows or as few as three rows of corded impressions. Often these are unevenly spaced. Generally, rectangular plats composed of vertical corded impressions occur under the incipient castellations. Present on the lower collar edge of some sherds are oblique punctates. These may have a crescent-shaped impression resembling a thumbnail added

to the end. Lips are flattened and smoothed. The surface is cord-marked or scraped. Temper is fine to medium-sized crushed quartz with some minor amount of mica and feldspar.

A variant form of this type is a restored vessel from the Brodhead-Heller site (Fig. 74 C). It is decorated with a corded collar, and a band of thumbnail impressions occurs on the lower collar edge and on the shoulder. The neck is smoothed and decorated with five rows of horizontal corded impressions. Corded punctates decorate the flattened lip. A single castellation appears to be present. This variant vessel has a rim diameter of three and three-fourths inches. A large rim sherd from the Camp Ministerium site has a calculated diameter of seven inches.

Remarks: Kelso Corded as defined by Lenig includes Owasco Corded Collar, Bainbridge Collar Incised, Hummel Corded, and Danville Corded. This is a common type in the Upper Delaware Valley, and it is considered to be closely related to Oak Hill Corded.

Temporal Position: Late Owasco to Oak Hill, about A.D. 1250 to 1350. A variant with an incipient collar and a platted motif was found in Feature 117 at the Faucett site, which was radiocarbon dated to A.D. 1310 ± 120 years. For the Kelso site in central New York there is a radiocarbon date of A.D. 1390 ± 100 years. However, Ritchie (1969a: 309) believes the actual date is closer to A.D. 1300, thus placing the chronological position of the type site at terminal Owasco or the beginning of the Oak Hill phase.

Distribution: South of the Adirondacks between the Hudson and Genesee valleys in eastern and central New York and in the upper Susquehanna Valley. In the Upper Delaware Valley the type is found at the Zimmermann, Manna, McCann, Brodhead-Heller, Faucett, Kutay, Brodhead, Peters-Albrecht (36-Pi-21), Camp Ministerium, Camp Miller, Davenport, Zipser, and Miller Field sites.

References: Ritchie and MacNeish (1949: 112-5), MacNeish (1952: 45, 53), Lucy (1959: 34), Lenig (1965: 6, 58).

OTHERS

Some Late Woodland pottery types do not belong to either the local Owasco or the Tribal Series. These types are described and discussed below.

Bowman's Brook Stamped (Fig. 49 e, f)

Description: This is a thin-walled collarless type with an everted and flattened lip. The latter is decorated with cord-wrapped stick impressions, while three horizontal rows of similar decorations occur on the neck. Vertical or diagonal impressions are barely perceptible on the neck. Temper is quartz, mica, and feldspar grit.

Temporal Position: Late Woodland, East River tradition, Bowman's Brook phase.

Distribution: Coastal New York and New Jersey. In the Upper Delaware Valley the type is found at the Faucett site.

References: Smith (1950: 191-2, Pl. 10, No. 24), Lopez (1958b: 134, Fig. 3, No. 4), Salwen (1968: 330).

Milo Corded (Fig. 49 m)

Description: This is an undecorated type with a weakly defined collar. The exterior and interior body surfaces are smoothed-over cord markings, while cord impressions on the collar are fairly conspicuous. The lip is flattened and slightly rounded. Fine quartz and mica grit are used as temper and the color is a dark chocolate brown.

Temporal Position: Late Woodland. Apparently associated with late Owasco as a trade piece.

Distribution: Northern New Jersey and metropolitan New York, including western Long Island and Bronx County. In the Upper Delaware, single sherds of this type are found at the Brodhead-Heller, Faucett, and Kutay sites.

Reference: Lopez (1958b: 133, Fig. 5, No. 1).

Ontario Oblique (Fig. 32, No. 4)

Diagnostic Features: Horizontal bands of oblique, parallel, incised lines occur on a collarless outflaring rim, creating a zigzag or herringbone pattern.

Temporal Position: Early Ontario Iroquois, Uren to Middleport substages, about A.D. 1200 to 1350.

Distribution: Southern Ontario and southwestern New York. In the Upper Delaware Valley sherds from a single vessel were found in two pits at the Zimmermann site.

References: MacNeish (1952: 18), Wright (1966: 111-3).

Late Woodland Plainware—Ministerium Variant (Fig. 74 A)

Description: This is a simple, plain, collarless form with an everted and flattened lip. Interior and exterior surface treatment is smoothed-over cord markings, while the color is light tan with some charcoal gray present. Temper is grit containing mica and feldspar.

Remarks: Possibly the type is related to the Plainware described by Cross (1956: 140-2) for Abbott Farm.

Local Distribution: A single restored vessel of this type was found at the Camp Ministerium site, and other examples of the type occurred at the McCann, Brodhead, Faucett, and Lee's Terrace sites.

Untyped Notched Lip—Zimmermann Variant (not illustrated)

Description: V-shaped notches are impressed on a flattened lip. Lips are angled toward the interior and rims are everted. Temper is medium to large pieces of crushed quartz in generous quantity. The exterior color is reddish tan while the interior is black. Both surfaces are smooth. Apparently the vessel was not made by coiling.

Temporal Position: Late Woodland.

Local Distribution: Sherds representing a single vessel of this type were found at the Zimmermann site.

Untyped Platted Punctates—Zimmermann Variant (Fig. 29, No. 2)

Description: A single row of annular punctates made with a reed or a similar hollow tool encircles the rim. Horizontal rows of shallow corded punctates are present on the neck. Annular punctates interrupt the corded elements and occur on the shoulder, where they encircle the vessel. The flattened lip is decorated with oblique cord impressions. Six incipient castellations may be present. Interior and exterior colors are buff to reddish. Exterior surface finish is smoothed-over cord markings, while the interior is smooth. The body is semiglobular and the temper is crushed quartz.

Temporal Position: Late Woodland.

Local Distribution: Sherds representing a single reconstructed vessel of the type were found at the Zimmermann site.

Untyped Plain Collar (not illustrated)

Description: This type has a plain, smooth collar formed with an applied rim strip.

Remarks: The form resembles Niagara Collared (MacNeish 1952: 26, Pl. VIII, Nos. 3-5).

Temporal Position: Late Woodland.

Local Distribution: Niagara Collared is found in western New York and Ontario. Sherds of this form were found at Bell-Philhower, Davenport, and Zimmermann sites.

Untyped Corded Collar (not illustrated)

Description: This is an unnamed type with corded decorations present on a low corded collar. A single row of cord impressions occurs below the lip, and there are nested squares to the right of the castellation. Apparently, four horizontal rows of cord impressions are present opposite the squares, and a single row of oblique cord impressions is applied to the base of the collar. Exterior color is buff to grayish buff, while the interior is charcoal gray, and the temper is fine grit with some mica present. The collar is convex, the lip is flattened, and the neck is slightly constricted.

Temporal Position: Late Woodland.

Local Distribution: Part of a single vessel of this type was found at the Zimmermann site.

INTERMEDIATE

The term Intermediate is used to designate two transitional pottery forms which occur between the local Owasco Series and the Tribal Series. The types are Bainbridge Linear and Oak Hill Corded.

Bainbridge Linear (Figs. 37, Nos. 15, 17, 19; 50; 85 N)

Description: A horizontal band of three to seven incised lines done in an interrupted lineal technique is present on a low-collared vessel. Rectangular plats may be present under incipient castellations. Slight gashes or notches may be on the rim and base of the collar. A horizontal band of decoration is sometimes applied to the shoulder. Angular quartz grit of medium to small grain size is used as temper.

A variant form from the Brodhead-Heller site has a medium-high collar decorated with five to seven irregular horizontal lines of crude fine-line incising. A similar horizontal band is on the shoulder, and short incisings are on the exterior lip edge. One vessel from Lee's Terrace has a calculated rim diameter of eight to nine inches, while a restored vessel from the Faucett site measures four and a half inches at the orifice.

Remarks: Bainbridge Linear as defined by Lenig includes Bainbridge Linear (Ritchie and MacNeish 1949: 115-6) and Iroquois Linear (MacNeish 1952: 18-9).

Temporal Position: Late Owasco to Early Tribal, about A.D. 1250 to 1400.

Distribution: Widespread in New York, eastern Ontario, and northern Pennsylvania. In the Upper Delaware Valley the type is fairly common, and it is found at Davenport, Zimmermann, Brodhead-Heller, McCann, Faucett, Kutay, Peters-Albrecht (36-Pi-21 and 22), Camp Ministerium, Lee's Terrace, and the Van Campen sites.

References: Ritchie and MacNeish (1949: 115-6), Lenig (1965:6).

Oak Hill Corded (Figs. 11 B; 43 M, Q; 45 B; 50; 73 D)

Description: Decoration consists of two or more horizontal bands of corded motifs composed of horizontal or oblique corded elements on a low to medium-high collar. Opposed triangular plats, right triangular plats, and vertical rectangular plats made by corded impressions may be employed in the design motif. Castellations are present and corded impressions may occur at the base of the collar and on the shoulder. The surface is corded or has smoothed-over cord markings. Very fine quartz and mica grit are used as temper. A restored vessel from the Faucett site has a rim diameter of five and a half inches.

Remarks: Oak Hill Corded as defined by Lenig includes Lanorie Corded (MacNeish 1952: 62-3). The decorative motifs of Oak Hill Corded anticipate the Tribal Series motifs of the Chance phase, while the technique employed to execute the motif is derived from Owasco.

Temporal Position: Late Owasco to early Tribal, about A.D. 1250 to 1400. A restored vessel with a relatively high collar is from Feature 52 at the Faucett site, which is radiocarbon dated to A.D. 1410 ± 100 years.

Distribution: Central and eastern New York, especially the middle Mohawk Valley, Jefferson County, and the St. Lawrence Valley; eastern Ontario; and the upper Susquehanna Valley of New York and Pennsylvania. In the Upper Delaware Valley the type is fairly common, and it is found at the Davenport, Zimmermann, Manna, Miller Field, Bell-Philhower, Faucett, Kutay, Pahaquarra, and Brodhead sites.

Reference: Lenig (1965: 6, 58).

TRIBAL SERIES

In this context the term Tribal is used as an adjective to refer to incised pottery. It designates all Chance phase pottery, Bowman's Brook, Overpeck, and Munsee as well as other late incised pottery types. The term does not refer to a particular ethnohistoric group, but is used to represent a pottery series in the same way the terms Point Peninsula and Owasco are frequently used. The term "unidentified Tribal" designates incised sherds too fragmentary for more precise type identification.

Tribal pottery (except Otstungo Notched, Bowman's Brook, and Overpeck Incised) is characterized by incised geometric plats on well-defined medium to high collars. Parallel horizontally incised bands frequently encircle the collar above and below the dominant motif. Incised decorative motifs which repeat those found on the collar may occur on the shoulder and neck. Vessels are thin-walled, and both interior and exterior surfaces are usually smooth. Fine quartz, feldspar, and mica grit in varying amounts are used as temper. In some instances the grit inclusions may have been a part of the clay rather than added as temper. Body shape is globular and two to four castellations are generally present.

Descriptions for the Chance phase pottery are from Lenig (1965: 6-8), with minor differences to allow for the regional variation within the Upper Delaware. MacNeish has also described these types (1952). They are found throughout eastern New York, especially in the Mohawk and Hudson valleys, extending northward to the St. Lawrence Valley and south to the northern Susquehanna and the Upper Delaware.

Deowongo Incised, Garoga Incised, and Durfee Underlined sherds were found in association in Pit 75 at the Kutay site, and charcoal from this feature radiocarbon-dated to A.D. 1400 ± 80 years. This compares with the date of A.D. 1398 ± 150 years for the Getman site of the Chance phase in eastern New York.

Chance Incised (Figs. 11 D; 35, No. 2; 38, No. 10; 43 A, C, D, R; 44 B, E, K; 45 A, C; 73 A-C; 74 D)

Description: A dominant band of well-made, opposed, incised, equilateral triangles occurs on a low to medium-high collar. In rare instances the plats are separated by small punctates or incised lines. Generally two, but sometimes three, incised lines occur above the dominant band. None is present at the base of the collar. The exterior lip edge is notched, and incipient castellations are usually present. A horizontal band of oblique incised lines may occur on the shoulder, while a double band occurs less frequently. In the latter instance the bands consist of opposed oblique lines which form a chevron pattern.

A variation within the type occurs as a continuous band of diagonally incised lines. On a minority of vessels the band is interrupted by a contrasting triangular plat at the castellation. Stacked and inverted incised V's occur occasionally under the castellation. At the Kutay site three larger vessels of this type have calculated rim diameters of 11 to 12 inches, 9 to 10 inches, and 7 to 8 inches, while two smaller vessels are between 4 and 5 inches in diameter.

Another Chance Incised variant occurs at the Zimmermann and Manna sites. The design is executed with fine-line incising and linear stamping, which form a triangular motif on the collar. The lip is transversely notched, and short linear line elements appear to have been executed with a cord-wrapped paddle.

Local Distribution: Chance Incised is common and it is found at the Kutay, Brodhead, Zimmermann, Faucett, Manna, Davenport, Miller Field, Bell-Browning, Rosenkrans Ferry, Camp Ministerium, and Bell-Philhower sites.

Deowongo Incised (Figs. 11 C, F; 32, No. 6; 35, Nos. 5, 6; 49 b, d; 73 G-I, K; 85 C, E, G)

Diagnostic Features: Small notches or short incised lines occur at the base of the collar under the Chance motif. Two vessels from the Kutay site have calculated rim diameters of five to six inches.

Local Distribution: The type is fairly common and is found at Zimmerman, Manna, Davenport, Faucett, Lee's Terrace, McCann, Brodhead-Heller, Kutay, Peters-Albrecht (36-Pi-22), Camp Ministerium, Miller Field, and Peters sites.

Durfee Underlined (Figs. 29, No. 3; 32, Nos. 1, 2; 38, Nos. 8, 9, 13; 49 a, c; 74 B)

Diagnostic Features: One to three incised lines encircle the collar under the dominant Chance motif. Small notches or incised lines may be present on the base of the collar. One restored vessel from the Brodhead site is executed in an interrupted style and has a rim diameter of eight and a half inches.

Local Distribution: The type is fairly common and is found at the Zimmermann, Manna, Davenport, Camp Ministerium, Faucett, Kutay, Brodhead, Zipser, and Bell-Philhower sites.

Garoga Incised (Figs. 38, Nos. 11, 12, 20; 73 J)

Diagnostic Features: Deep notches or punctates are present on the base of the collar beneath the Chance motif. A Garoga variant from the Kutay site occurs in the form of a horizontal band of incised lines interrupted by vertical right angle punctates. A horizontal band of similar punctates encircles the vessel on the rim. One rim sherd from the Kutay site is from a vessel with a calculated diameter of eight to nine inches while another has a diameter of six to seven inches.

Remarks: As defined by Lenig (1965: 6-7), this type includes Otstungo Incised, Fonda Incised, Cayadutta Incised (MacNeish 1952: 76-8), Kingston Incised, Hudson Incised, and Hudson Crescent Incised (Ritchie 1952: 24), except those sherds decorated with horizontal line motifs.

Local Distribution: The type is fairly common, especially in late Chance phase components at the Zimmerman, Manna, and Bell-Philhower sites. It is also found at the Miller Field, Faucett, Kutay, Brodhead, and Camp Ministerium sites.

Otstungo Notched (Figs. 37, No. 8; 38, Nos. 1, 3, 7; 43 E-G; 44 H; 49 h)

Diagnostic Features: Vessels are collarless and lips are everted and thickened. Lips are incised and exterior and interior rim edges are notched.

Remarks: In the Mohawk and Hudson valleys this is a minority type of the Chance phase, and this is also true for the Upper Delaware Valley.

Local Distribution: The type occurs in a relatively small quantity at a number of sites. It is found at Peters-Albrecht (36-Pi-22), Faucett, Camp Ministerium, Miller Field, Zimmermann, Manna, and Davenport sites.

Overpeck Incised (Figs. 38, No. 6; 49 g, i)

Description: This type is collarless with a slightly everted rim. Decoration consists of broad, shallow incised lines forming triangles around the rim. Triangular elements may be filled with oblique lines. Decorations are applied over a cord-marked surface. Colors are reddish tan to gray. Temper is crushed quartz and/or shale grit. Bases are conoidal.

Remarks: Witthoft (1956) identifies the Overpeck site near Kintnersville, Pennsylvania, with historic Lenape. Lopez (1961: 31) suggests that the distribution of Overpeck Incised and Bowman's Brook Incised pottery corresponds to the Unami division of the Lenape. The former is identified with a western branch of the Lenape and the latter with an eastern branch.

Temporal Position: Protohistoric and Historic.

Distribution: Overpeck Incised is found primarily below the Water Gap along the Lehigh River south to Philadelphia. It is the dominant type at the Overpeck site near Easton, Pennsylvania, and is found at the Abbott Farm site in New Jersey. In the Upper Delaware it is found in small quantities at the Faucett, Zimmermann, Miller Field, and Bell-Philhower sites.

References: Cross (1956: 153-4), Lopez (1961: 19, 31), Witthoft (1956).

Bowman's Brook Incised (Fig. 49 1)

Description: Decoration consists of incised lines arranged in horizontal, vertical, diagonal, or zigzag patterns. Chevron and herringbone plats are used. Small punctates may be used as borders. Temper is quartz and mica grit. The vessel form is collarless, and the sides are straight or slightly converging near the mouth. The body surface is smooth and bases are conoidal.

Remarks: Bowman's Brook Incised is best known from coastal New York, where it is diagnostic of the East River aspect. Bowman's Brook Incised, Overpeck Incised, and Townsend Ware are related pottery types.

Temporal Position: Protohistoric and Historic.

Distribution: Coastal New York to the Delmarva Peninsula. In the Upper Delaware Valley the type is found at the McCann, Lee's Terrace, Miller Field, and Faucett sites.

References: Smith (1950: 192), Cross (1956: 153), Lopez (1961: 18).

Abbott Zoned—Kutay Variant (Fig. 74 E)

Description: The decorative motif consists of four distinctive opposed horizontal bands of incised elements. These bands create a horizontal zigzag or herringbone pattern. The collar base has moderately bold notches and there are also notches on the exterior lip edge. The diameter at the orifice is six and a fourth inches.

The vessel has a smooth body, is blackish in color, and is tempered with very fine quartz, feldspar, and mica grit. Body form is globular, the neck is constricted, and the moderately high collar is straight sided.

Remarks: This distinctive variant was uncovered from Feature 3, Kutay site, which also yielded Chance Incised pottery. Similar incised motifs, consisting of as many as six horizontal bands, can be found on Abbott Zoned Incised (Cross 1956: 144-5, Pl. 41a), and there are similarities to designs found on the Townsend and Rappahannock wares from the Mispillion site near Milford, Delaware (Lopez 1961: Pl. 2, No. 14; Fig. 1, No. 2).

The Kutay variant may be interpreted as the combination of an Abbott Zoned motif on a collared vessel of the Chance phase, although the vessel form is not typical for Chance.

Distribution: Abbott Zoned Incised is found at the Manna site. The type is uncommon in the Upper Delaware Valley, but occurs more frequently in the middle and lower Delaware.

Munsee Incised (Figs. 11 A, G; 32, No. 5; 36; 38, Nos. 14-19, 21, 22, 24; 43 B, H; 44 A, C, F, G, I; 73 F; 74 F; 85 F, I)

Description: Diagnostic features are a dominant motif of an incised horizontal band comprised of geometric plats on low- to high-collar vessels. Stylized face effigies made with elliptical punctates forming the eyes and mouth are present. The vessel form is globular.

Munsee Incised is an elaboration upon the opposed triangular motif of Chance Incised. In addition to opposed equilateral triangular plats, Munsee Incised utilizes plats shaped as right triangles, parallelograms, diamonds, rectangles, and nested V's.

Two to four castellations are usual, with the latter more common. There is a distinctive treatment under the castellation which may take the form of a face effigy on Leslie's Style I or the more elaborate plat elements found on Styles II, III, and IV (Leslie 1968b: 127, 129, 131). More frequently the decorative motif occurs on medium- to high-collar vessels. A vertical rectangular plat flanked by plats in the form of parallelograms is a common motif. The intervening right triangular plat is filled with either incised lines or small punctates (Witthoft 1959a: 41, Fig. 2 F). Nested V-shaped plats are sometimes employed under the castellations.

Areas between adjacent plats are occasionally filled with short incised lines producing a ladder effect (Leslie 1968b: 131). Both small punctates and short incised lines are used as borders between plats, and these punctates and incised lines may be vertical, horizontal, or diagonal.

A horizontal band occurs above the dominant band. This usually consists of a band of short diagonally incised lines or a band of two to four incised lines encircling the collar. Not infrequently two distinctive bands are present. Lips are generally flattened and smoothed. Deep notches usually occur at the castellations.

A horizontal band of short oblique incised lines may be present on the collar base. Sometimes the motif is underlined, as in Durfee Underlined, or the distinctive notches of Garoga Incised may be present.

On a minority an incised, decorative, geometric motif is applied to the shoulder (Leslie 1968: 131; New Jersey State Museum Collections, Pahaquarra Boy Scout site, Pit 84), with the intervening neck area smooth and undecorated. On occasion face effigies are present at the collar base as well as the rim.

Another style, Munsee Oblique (Fig. 38, No. 16), is reported by Werner on the basis of a minority form present at the Zimmermann and Davenport sites. At the latter it is associated with European trade materials. This is a broadened lip form similar to Otstungo Notched. Opposed, oblique paddle-edge impressions occur on the lip and these encircle the vessel. Other features are similar to Munsee Incised.

Temper is small to medium-sized quartz, feldspar, and mica grit in varying amounts. Some sherds are heavily tempered. [Refer to Witthoft (1959a: 51-6) for a detailed discussion of the physical characteristics of this pottery.]

Remarks: Witthoft (1959a: 51-6) and Leslie (1968b: 130-8) have previously described the type, and it is illustrated by Ritchie (1949: Pl. 20-2) as Kingston Incised. The former described Munsee in broad terms on the basis of a fairly restricted sample size. Leslie, with a larger sample available, recognizes four styles based primarily upon collar height and shoulder decoration.

The present description utilized other collections, but, as the previous authors discovered, it was not possible to establish a meaningful chronology by seriation because of the still inadequate sample size. A peculiar problem in dealing with Munsee pottery lies in the fact that because of the extensive nature of its decorative motif, large sherds are required for positive identification, whereas only small ones are usually available.

Munsee Incised is derived locally from Chance Incised, Deowongo Incised, Durfee Underlined, Garoga Incised, and Kingston Incised. Its ultimate form is an elaboration upon these motifs. There is a hint of external relationships from outside the area in the form of variant styles.

Leslie (1968b: 123, 125) illustrates two nearly identical variant forms. One is from Pit 8 at the Davenport site, Sussex County, New Jersey, and the other is a vessel from a rock shelter near Canadensis, Pennsylvania. These vessels have strong horizontal band elements, a characteristic of Washington Boro Incised (Kinsey 1959a: 78-9). It is possible that this style is a blend of Susquehannock and Munsee, with the former supplying the major inspiration for the decorative motif and the latter the vessel form.

Pit 19 at the McCann site yielded a curious high-collared form which might be interpreted as a blending of Bradford County and Wyoming Valley Susquehannock Schultz Incised with Munsee Incised. In this instance the high collar and some of the design elements are Susquehannock, while other design elements are Munsee and the paste is Munsee-like. At least three shell-tempered Susquehannock Wyoming Valley sherds were found at the Pahaquarra Boy Scout site in New Jersey along with Munsee pottery. (New Jersey State Museum Collections No. 9850. These may be from a single vessel.) This pottery attests to some measure of Susquehannock and Munsee contact.

Munsee pottery remains somewhat of an enigma. It is identified with the poorly understood Munsee or Minsi Indians of the Minisink country. These were apparently Algonquians, perhaps loosely affiliated with the down-river Delaware tribes.

Temporal Position: As a pottery type, Munsee Incised probably begins about the middle of the fifteenth century and lasts until the first quarter of the seventeenth century. By most standards this is too long for a single type to endure during the Protohistoric and Historic periods. Internal chronology must be granted to Munsee Incised. It is probably correct to assume that the increasingly elaborate decorative motifs and high-collared forms are the latest in the sequence; however, this remains to be demonstrated.

Distribution: The type has a distribution which is centered between the Water Gap and Port Jervis, New York, much of it concentrated in the Milford-Minisink area. It is also found in the small valleys and feeder streams of the Delaware, and to the west in the Wyoming Valley in the Wilkes-Barre area and in the upper Susquehanna Valley. In the Upper Delaware Valley the type is fairly common and is found at the Rosenkrans, Bell-Browning, Bell-Philhower, Miller Field, Davenport, Manna, Zimmermann, Brodhead-Heller, Peters-Albrecht (36-Pi-21 and 22), McCann, and possibly Lee's Terrace, Kutay, and Brodhead sites.

References: Ritchie (1949), Witthoft (1959a: 51-6), Lucy (1959: 36-7), Leslie (1968b: 130-8).

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Index

Abbott Farm site, 37, 39, 51, 114, 404, 418, 422, 432, 451, 454, 456-7, 466, 471
Abbott pottery: Dentate, 458; Fabric-Impressed, 457; Zoned Variant, 241, 243-4, 251, 253, 392, 472
Accokeek Creek site, 342, 420, 422, 432, 445
Adena culture, xix, 363-4, 367
Adena-Middlesex phase (component), 364, 369, 445
Albemarle pottery: Fabric-Impressed, 457; Net-Marked, 456
Algonquin-speaking Indians, 297, 299, 393, 475
Angostura projectile points, 330
Appalachians, xi, xvii, 337, 340, 347-8, 404
Ashtabula projectile points, 348, 429
Assmus, Fred, xxii, 111
Ayers, Havard, 429

Bainbridge pottery: Collared Incised, 14, 46, 111, 464; Interrupted Linear, 306; Linear, 14, 99-102, 111-2, 166, 168, 171, 194-5, 197, 203, 205-6, 219, 223, 241, 243, 253, 271-2, 276-7, 279, 283, 288-9, 293, 297, 299, 382, 467; Notched Lip, 111
Bainbridge site, 125
Bear Island complex, 337, 342; projectile points, 123, 337
Barnes Hill Rock Shelter, 383
Bates site, 389, 461
Beal site, 391
Beck I and II sites, xiii
Beekman Triangle projectile points, 334-5, 439
Beisler Upper South Field site, xiii, xv
Bell-Browning sites, xi, xv, xviii, xx, 81, 129, 131-58, 373, 374-5, 380, 391, 470, 475
Bell-Philhower site, xv, xviii, 46, 51, 61, 107, 111, 125-6, 328, 373-4, 377, 380, 390-1, 393, 462-3, 466, 468, 470-1, 475
Bent site, 342
Bevans and Moodys Rock Shelter, xviii
Bifurcate-Stemmed projectile points, 145, 212, 295, 298, 316, 319, 331, 335, 422-3
Big Brother I and II sites, xiii
Big House Ceremony, 48, 376, 392
Big Sandy projectile points, *see* Otter Creek projectile points
Binford scale (pipes), 144
Blasi site, xiii
Boats site, 407
Boehme I and II sites, xiii
Boro site, xiii
Bowman's Brook phase (component), 465
Bowman's Brook pottery: Incised, 14, 45-6, 167, 171, 185, 195, 197, 250, 283, 289, 293, 298, 300, 382, 392, 468, 471-2; Stamped, 167, 171, 194-5, 197, 250, 392, 464-5
Bowman's Brook site, 39
Brace site, xv
Brent site, 415
Brewerton phase (component), 146, 211, 220, 337, 339-40, 342-3, 398, 404, 406
Brewerton projectile points, 177, 181, 196, 211, 217, 234, 304, 336, 339-40, 342, 407, 418; Corner-Notched, 335, 338, 340, 401, 403, 405, 444, 446; Eared-Notched, 175-6, 186, 209, 211, 217, 220, 295, 298, 335-7, 339-40, 401, 403, 406-7, 446; Eared Triangular, 145, 335, 337, 340, 401, 403, 406, 421, 446; Side-Notched, 21, 29, 145, 178, 228-9, 233, 237, 335, 338, 340-1, 401, 403-6, 444, 446
Brewerton site, 407
Brewerton-Laurentian influences, 343
Brewerton-Laurentian projectile points, 337
Brewerton-like projectile points, 273, 278
Broad-Stemmed projectile points, 444-6
Brodhead-Heller site, xiii, xv, xvii, 22, 116, 123, 176, 182, 199-223, 237, 266, 309, 328, 332, 336, 339, 342, 345, 350-2, 354-5, 357-8, 364, 367, 370-1, 380, 389, 407, 411, 413-4, 416, 426-7, 431-3, 454-5, 457-8, 462-5, 467, 470
Brodhead Net-Marked Pottery, 16, 38, 164, 170-1, 193, 197, 259, 263, 265-6, 305, 310, 365-8, 371, 455-6
Brodhead site, xiii, 164, 257-67, 364, 366, 370-2, 431, 433, 438, 454-7, 462, 464, 466, 468, 470-1, 475
Broughton Hill site, 391
Browning and Pharo I and II sites, xiii, xv
Broyles, Bettye, 420
Buckwood Park site, 45
Bushkill complex, xxvii, 123-4, 161, 163, 166, 170, 172, 175, 178-9, 183-5, 188, 191-2, 195, 197, 219-20, 226, 278-9, 310, 320, 364-71, 397-8, 436-7, 454, 456

Calvert projectile points, 420
Camp Hagen site, xiii
Camp Miller site, xiii, 240, 321-5, 389, 433, 464
Camp Ministerium site, xiii, 266, 269-79, 454, 463-4, 466-7, 470-1
Canandaigua Plain pottery, 16, 44-5, 380
Carolline d'Alleppo (bead), 53
Carpenter Brook Cord-on-Cord pottery, 16, 89, 96-7, 101, 111, 271-2, 275-8, 380, 461
Carpenter Brook phase (component), 125
Castle Creek phase (component), 111, 127, 156
Castle Creek pottery: Corded Neck, 99, 102, 112, 114, 127, 259, 380, 463; Incised Neck, 99, 102, 112, 127, 153, 463; Punctate, 14, 44, 102, 111-2, 463
Castle Creek site, 125, 461
Cayadutta Incised pottery, 128, 471
Chance Incised pottery, 14, 47-9, 100-2, 109, 111, 113-4, 126-8, 137, 149-53, 155, 157-8, 166, 171, 193-5, 197, 241-4, 251-4, 259, 267, 271, 276-7, 279, 382-3, 389, 468-70, 472-4
Chance phase, 114, 125, 128, 156, 194, 241, 252-6, 382, 469, 471-2
Chandler, Mary, 54
Christiana quarries, 35, 121
Clearview Stamped pottery, 458
Clemson Island pottery, 16, 39, 45-6, 89, 96-7, 101, 110, 125, 380, 451, 460-1
Clovis projectile points, 199, 209, 212, 327-9, 443
Coastal tradition, 337
Coburn phase, 117-8, 359, 431
Coe, Joffre L., 425
Coffin, Edwin, 134
Cole, A. Colin, 54
Collared Punctate pottery, 101
College of Arms, London, 54
Corded Punctate pottery, 259
Cotter, John L., xxi, 227
Cox, Mary and Thomas, 54
Cresap Stemmed projectile points, 363, 367
Cross, Dorothy, xvii, 454
Cuddeback site, xv
Cumberland projectile points, 328
Cunningham site, 368, 370-1

Dalrymple, Edward S., 134
Danville Corded pottery, 464
Davenport site, xv, xviii, 51, 128-9, 377, 391, 438-9, 442, 454, 459, 462, 464, 466-8, 470-1, 474-5
Debert site, 330
DeGraw, William, xxii, 111
Delaware Indians, 51, 132, 393, 471
Delaware Valley Archaic complex, xxvii, 20, 29, 59, 69, 116, 161, 176-7, 179-82, 185-6, 196, 205, 210-1, 216-7, 220-2, 235-7, 266, 273, 278, 284, 295, 298, 302, 307, 311, 316, 319, 320, 334-7, 339, 342-3, 349, 354, 408-9, 411, 413-4
Delaware Valley Archaic complex projectile points, 175, 212, 228; *see also* Lackawaxen
Delaware Water Gap National Recreation Area, xvii, xix
Dentate Stamped pottery, 88-9, 123, 164, 170-1, 197, 206, 293, 297, 305, 365-6, 368, 371, 457-8
Deowongo Incised pottery, 14, 47-8, 98, 100-1, 103, 109, 111, 127-8, 149, 157, 167, 171, 194, 197, 206, 219, 241-3, 252-3, 255, 271-2, 276-8, 293, 298, 300, 315, 318, 320, 382-3, 390, 469
Deowongo Island site, 255
DeTurk industry, 331
Dincauze, Dena F., 431
Dragoo, Don W., 363, 404, 420
Dry Brook Creek, 55-6
Dry Brook Fishtail projectile points, 72, 75, 77, 117-8, 207, 294, 298, 306, 324, 356-7, 428, 430-1, 447
Dry Brook phase (component), xxvii, 71, 75, 84, 117-22, 218, 222-3, 309, 348, 350-1, 355-7, 360, 431
Dry Brook projectile points, 65, 77, 84, 203, 209, 218, 222, 286, 304, 309, 311, 348, 350, 355, 358, 401, 429, 431-2
Dry Brook-like projectile points, 286
Dry Brook/Orient phase (component), 309-11, 320, 325
Durfee Underlined pottery, 14, 48, 91, 98-102, 110-1, 113, 127-8, 149, 157, 167, 171, 193-5, 197, 243-4, 252-3, 255, 259, 265, 267, 271, 276-7, 298, 382-3, 389-90, 469-70, 473-4
Dustin projectile points, 421
Dutchess Quarry Cave, 328, 330-1

Eared projectile points, 420-1
Early Series pottery, 14, 16, 164, 166, 168-71, 190, 205-6, 218-9, 259, 264, 266, 271, 275, 278-9, 283, 289, 293, 297, 299, 305, 310-1, 364, 366, 368, 451, 453, 458
Early Series projectile points, *see* Lagoon and Rossville points

East Steubenville Shell Heap, 444
Eden projectile points, 330
Egypt Mills projectile points, 146, 209, 211, 217, 220, 228-9, 231, 234, 236-7, 336-7, 341, 405, 409, 413-4, 446
Egypt Mills sites, xiii, 177, 196, 224-37, 332-3, 336, 341-2, 405, 411, 414-5, 417, 422, 433
El Rancho site, 49
Elongated Triangular projectile points, 15, 19, 207, 284, 288, 315
Erb Rock Shelter site, 418
Eshback projectile points, 172, 175-6, 181, 187, 196, 268, 288-9, 304, 316, 319, 335, 337, 339, 409, 417-9, 446
Eshback sites, xiii, xv
Eshelman site, 300
European trade goods, 2, 5, 40, 50, 131, 140, 149, 156, 195, 384, 391, 474
Eva projectile points, 419
Exterior Corded/Interior Smoothed pottery, 87, 89, 91, 94, 123-4, 163-4, 168, 170-1, 190-1, 196-7, 205-6, 259, 266, 293, 297, 305, 356, 358, 360, 362, 366, 368, 433, 435, 454
Fabric-Impressed pottery 164, 170-1, 193, 197, 206, 259, 264, 293, 297, 305, 310, 365, 368, 371, 445, 457
False Face Ceremony, 392
Farrell Farm site, 237, 341-2, 416-7
Faucett site, xiii, 34, 123-4, 159-97, 205, 237, 250, 259, 266, 309-10, 332, 336, 339, 345, 350-5, 358, 360-2, 364, 366-8, 370-3, 375, 377, 382, 390, 397-8, 407, 411, 413, 418, 426-7, 431, 433, 435-6, 438, 453-8, 464-8, 470-2
Flint Ridge chalcedony, 92, 429
Fonda Incised pottery, 128, 471
Fox Creek projectile points, 367, 445
Franke Collection, 379-80
Fresno projectile points, 439
Friedman Knoll site, xv
Friedman I and II sites, xv, 334, 336, 352, 418, 426-7, 433, 439, 454
Frontenac Island site, 345, 404
Frost Island phase (component), xxvii, 12, 28, 32-3, 117, 121-2, 347-8, 350-1, 355, 427, 429, 431
Frost Island site, 348
Funk, Robert E., 328, 337, 417, 445

Garoga Incised pottery, 14, 48-9, 99-100, 103, 110-1, 113-4, 128, 171, 197, 242-3, 252-3, 255, 259, 265, 267, 271, 276, 382-3, 390, 469-70, 473-4
Gaston site, 345
Gay Shriver site, 420
Generalized Side-Notched projectile points, 88, 92, 94, 145, 175, 178, 192-3, 207, 243, 261, 266, 273, 279, 295, 298, 307, 311, 316, 318-9, 331, 346, 364-6, 369-70, 440, 443-4, 447; Small Side-Notched, 211-2, 254
Generalized triangular projectile points, 15, 19, 39-40, 103, 105, 107, 145, 261, 306, 324, 357, 385
Genesee Cord-Marked pottery, 455
Genessee projectile points, 345, 354, 429
Getman site, 255, 469
Glacial Kame complex, 121
Goodyear Lipped pottery, 48, 149
Goose Island site, 117
Gottier site, xiii
Graybill, Jeffrey, 399
Guilday, John E., xxi, xxiii, 114, 118, 137, 154

Haggerty, Lewis M., xviii, 363, 450
Hamilton North Field site, xiii
Hamilton projectile points, 439
Hankin North and South Field sites, xiii
Harlan Mills Quarry, 35
Harrington scale (pipes), 52, 144, 227
Harry's Farm site, xiii, 45, 51, 389, 425
Hartwick site, xv, 455
Hayes, Charles, 416-7
Heckewelder, John, 133
Helderberg Flint, 40, 107, 337, 430-1
Herring No. I and II sites, xix, xv, 119, 123, 129, 332, 336, 411, 414, 418, 420, 427, 433
Heye, George G., 134, 391
Hill site, xiii, xv
Historic period, 2-3, 39, 49, 51, 53, 149, 377, 384, 389, 391-3, 439, 471-2, 474
Hogback site, xiii
Hopewell, 363-4, 369, 372, 444, 458
Hornblower I and II sites, 341, 407
Howland site, 370-1
Hrdlicka, Ales, 134
Hudson Valley Incised pottery, 128, 471
Hull site, xv
Hummel Corded pottery, 464
Hunter's Home phase (component), 40, 42, 367, 372, 438-9

Ibaugh site, 143
Incised Collar Series pottery, 14, 39
Intermediate Series pottery, 14, 39, 166, 168, 170-1, 193, 195, 197, 206, 219, 243, 271, 283, 293, 306, 378, 451, 467

Iroquois, 8, 26, 29, 299, 373, 382, 393
Iroquois New Year or Mid-Winter Festival, 376, 392
Iroquois (pipes), 49
Iroquois pottery, 14, 47, 128, 134, 149, 383, 392, 442, 467
Island Field site, 372, 438

Jack's Reef Corded pottery, 89, 96-8, 102, 125, 372, 459
Jack's Reef Corner-Notched projectile points, 88, 92, 124, 178, 192, 261, 264, 266, 286, 304, 315, 320, 372, 401, 434, 437-9, 447
Jack's Reef Pentagonal projectile points, 88, 92, 124, 261, 266, 304, 315, 320, 372, 401, 434, 438-9, 447
Jack's Reef site, 102
Jamesport site, 12, 34-5
Jamestown, Va., 53
Juniata Thick pottery, 454-5

Kalkberg Flint, 328
Kanawha Stemmed projectile points, 422
Kautz site, xiii
Kelly phase, 331
Kelso Corded pottery, 5, 14, 44, 46-7, 98-9, 101-2, 112-4, 127-8, 149, 151, 153, 157, 167, 171, 194, 197, 206, 219, 241, 243-4, 253, 271-2, 275, 277, 293, 297, 299, 305, 309, 311, 323, 381-2, 390, 462-4
Kelso site, 382, 464
Kent, Barry, 393, 411
Kent-Halley site, 337, 419, 422
Kingston Incised pottery, 128, 383, 471, 474
Kingston site, 255
Kinsey, W. Fred III, xx, xxiii, 23, 34, 199, 373-4, 376, 397, 399
Kipp Island phase (component), 124, 192, 367, 369, 372-3, 398, 438-9
Kipp Island Site, 458-9
Kirk projectile points, 330
Kirkwood site, 391
Kittatinny limestone, 1, 40
Kittatinny Mountains, xi, xiii, 1, 133
Knight site, xiii
Kober site, xiii
Koens-Crispin phase (component), 10-2, 19-20, 24, 30-1, 116, 319, 335, 344, 347, 349-52, 355
Koens-Crispin projectile points, 10-1, 13, 30, 209-10, 217, 249, 339, 350, 352-4, 401, 414, 423-6, 447
Kokolias site, xv
Kraft, Herbert C., xx, xxiii, 346, 352, 358, 360, 367, 369, 373, 375-6, 388-9, 401, 423, 425
Kunkle, Harry, 435
Kutay site, xiii, xv, xvii, 239-56, 374-5, 382, 388, 390, 464-5, 467-72, 475

Lackawaxen Converging Stem projectile points, 69, 146, 229, 231, 234-6, 284, 286, 302, 304, 307, 316, 318, 333-6, 341, 367, 408-11, 436, 446
Lackawaxen phase (component), 119, 146, 216, 220-1, 339, 397-8, 411
Lackawaxen projectile points, 175, 212, 228, 405, 411, 414, 418, 420
Lackawaxen site, 20, 35
Lackawaxen Expanded Stem projectile point, 205, 209, 211, 217, 220, 236-7, 286, 295, 298, 333-6, 408-11, 414, 446
Lackawaxen Straight Stem projectile points, 29, 69, 71, 74, 76, 116, 123, 186, 211, 228-9, 234-7, 273, 278, 286, 288-9, 295, 298, 302, 304, 307, 311, 316, 318-9, 333-8, 341, 367, 408-11, 446
Lackawaxen tradition, 335, 337
Lagoon complex (component), xxvii, 123-4, 192, 366-8, 370-1, 436
Lagoon projectile points, 88, 96, 123, 163, 172, 175, 177-8, 191, 193, 197, 261, 264, 266, 364-8, 370, 434, 436-7, 445, 447
Lake Lenape site, xiii
Lamoka projectile points, 337, 341, 343, 401, 412, 417, 421-2, 446
Lamoka-like projectile points, 228-9, 234, 237, 261, 266, 295, 297-8, 304, 316, 318-9, 335-7, 341-2, 405, 412-3, 416-7, 446
Lanorie Corded pottery, 98-9, 102, 112, 127, 468
Lanorie Crossed pottery, 102, 111, 127, 382, 392
Lapham, Davis M., xxi, 119
Late Woodland Plainware pottery, 171, 244, 259, 276-7, 279, 289, 293, 299
Late Woodland Plainware, Ministerium Variant pottery, 271, 283, 380, 465-6
Laurentian projectile points, 217, 327, 403, 405, 411, 415
Laurentian tradition (component), 176, 216, 298, 331, 336, 343, 402, 404, 420, 423, 446
Laurentian-type copper implements, 337
Lawrence, Barbara, 137
LeCroy Bifurcated projectile points, 331, 422

Lee's Terrace site, xiii, xv, 177, 280-9, 375, 389-90, 418, 433, 466-7, 470, 472, 475
Lehigh phase (component), 13, 19-20, 31, 116, 318-9, 346-55, 425-6
Lehigh projectile points, 30, 175-6, 187-8, 204, 209-11, 217, 221, 261, 266, 278, 286, 295, 298, 304, 316, 318-9, 335, 339, 344, 346, 349-53, 401, 414, 423-6, 447
Leibhart, Bert site, 391, 455
Leibhart, Donald, 435
Leibhart, Oscar site, 362, 391, 435
Lenape Indians, *see* Delaware Indians
Lenig, Donald, 462, 464, 467-8
Lenni Lenape Indians, *see* Delaware Indians
Leslie Collection, 431
Leslie, Vernon, xviii, xxiii, 401, 418
Levanna Cord-on-Cord pottery, 16, 89, 96-7, 99, 102, 109, 112, 323, 380, 461-2
Levanna projectile points, 5, 19, 39-40, 96-7, 105, 125, 144-5, 153, 157, 172, 194-5, 206, 209, 219, 243, 271, 277, 284, 286, 288, 293, 297, 304, 306, 385-6, 401, 438-42, 447
Lillie site, xv
Living Solid Face, 48
Long projectile points, 345, 353-4
Long site, 116, 426
Ludwig site, xv

McBride sites, xiii
McCann I and II sites, xiii, xv, 240, 290-300, 323, 374-5, 389-90, 431, 433, 454-5, 457-8, 462-4, 466-7, 470, 472, 474-5
McCarty site, xv
McKibben site, 407
MacNeish, Richard S., 469
McNett, Charles W., Jr., 199, 221, 429
Macpherson Collection, xxv, 176-7, 209, 328-9, 331-2, 336-7, 353, 357, 361, 364, 369, 372, 399, 407, 419, 422-3, 425, 429-31, 433-9, 443, 446-8, 450
Macpherson component, 146, 418
Macpherson, Havard, xxv, 399, 418, 427
Macpherson pipe, 450
Macpherson projectile points, 145, 172, 175-6, 181-2, 187, 196, 205, 209-11, 217, 220, 273, 278, 304, 333, 335-7, 341, 411-2, 431, 446
Macpherson site, xiii, 404-6, 408, 411, 413-4, 417, 419-21, 425, 436, 441
Madison projectile points, 5, 15, 19, 39-40, 145, 157-8, 172, 195, 206, 209, 219-20, 243, 261, 271, 277, 283, 286, 288, 293, 297, 304, 306, 315, 385-6, 401, 439-40, 442, 447
Madison site, 37
Manna site, xv, xix, 372, 433, 438, 475
Mansion Inn projectile points, 429
Mansion Inn site, 84, 348
Marcey Creek Plain pottery, 16, 37-8, 356, 358, 360
Marcey Creek site, 420, 425, 451
Marchiando, Patricia, xviii, xx, xxii, xxiii, 334, 373, 375-6, 401, 418
Mason, Ronald J., 327, 329
Matamoros projectile points, 439
Maud projectile points, 439
Maxaner site, xv
Maxon-Derby site, 389, 461
Mayer-Oakes, William J., 444
Meadowood phase (component), 90, 121, 123, 161, 163, 170, 179, 185, 188, 190-1, 196, 266, 299, 358, 361-2, 397-8, 455
Meadowood projectile points, 88, 90, 92, 94, 123, 163, 172, 175, 178, 190-1, 196, 209, 243, 254, 261, 264, 286, 294, 297, 361-2, 433, 438-9, 442, 445, 447, 459, 461-4, 468, 470-2
Meadowood-like projectile points, 212, 219, 223, 306
Mecharienkonck, 390
Medwin sites, xiii, xv
Metz site, xv
Michaels I and II sites, xiii
Michels, Joseph, 454
Middle Atlantic Seaboard Culture Province, 337
Middlesex phase (component), 363-4, 369
Milanville projectile points, 284, 286, 288, 298, 443
Milanville Side-Notched-like projectile points, 295
Miller Field sites, xiii, xx, 1-54, 123, 182, 192, 197, 309, 319, 332, 336, 343, 348-55, 358, 360, 364, 367, 373, 375, 377, 380-1, 388-91, 423, 425-7, 433, 436, 442, 451, 453-6, 460, 462-4, 468, 470-2, 475
Mill pond site, 420-1
Milo Corded pottery, 167, 171, 194, 197, 203, 206, 219, 241, 243, 250, 253-4, 392, 465
Minguannon site, 37
Minisink area, 133, 158, 380, 391, 393, 475
Minisink Island, xviii, 46, 132-4, 369, 372, 379-80
Minisink site, 372
Minisink village, 133
Minsi Indians, *see* Munsee Indians

Mispillion site, 472
Mockley Net-Marked pottery, 418, 456
Modified Interior Cord-Marked pottery, 87, 89, 94, 368, 455
Moeller, Roger, 399
Mohawk pottery, 45, 49, 392-3
Mohawk tradition, 382, 388
Monacacy site, 429
Montagnais-Naskapi Tribe, 299
Moravian missionaries, 51
Morrow Mountain I and II sites, 337
Morse, S. Anthony, xxiv, 170
Munsee, Cemetery site, 377, 391, 463
Munsee Incised pottery, 5, 14, 45, 47-9, 98-101, 103, 110-1, 113, 126, 128-9, 134, 137-8, 144-5, 149-53, 156-8, 205-6, 219, 241-2, 244, 251, 272, 283, 289, 293, 298, 300, 306, 311, 315, 317-8, 383-4, 391, 393, 468, 473-5
Munsee Indians, 393, 475
Munsee Oblique pottery, 101, 103, 113, 129, 474
Munsee phase (component), 125, 127, 130, 133, 138, 156, 158, 289, 297, 299, 309, 311, 317-8, 320, 375, 389-90, 393, 475
Munsee-like pottery, 243, 253, 259, 267
Muskeeta Cove site, 368, 370-1, 457

Nahrwold sites, 361
National Park Service, xix, xx, xxiii, 199
Newcomb site, xiii
Newton Falls Side-Notched projectile points, *see* Otter Creek projectile points
Niagara Collared pottery, 103, 113-4, 127, 392, 466
Normanskill phase (component), 222, 342-3
Normanskill projectile points, 21, 29, 204, 228-9, 233, 237, 286, 295, 298, 304, 316, 318-9, 335, 337, 341-2, 401, 412, 414-6, 446
Normanskill-like projectile points, 209, 218, 220, 222, 228-9, 233, 237, 284, 286, 288, 335, 337, 341-2, 405, 412, 415-7, 446
North Beach Net-Marked pottery, 456
Notched Lip pottery, 380; *see also* Otstungo Notched pottery

Oak Hill Corded pottery, 5, 14, 47-8, 127, 151, 155, 166, 168, 171, 193-5, 197, 241-2, 315, 382, 390, 464, 467-8
Oak Hill horizon, 157, 382
Oak Hill phase (component), 390, 464
Oak Island site, 406, 429, 432
Old Copper culture, 121
O'Neil site, 404, 427, 429, 431, 461
Onondaga chert, 36, 75, 90, 92, 175, 178, 191, 197, 243, 286, 348, 361-3, 369, 433, 435, 445
Ontario Iroquois, 114, 127, 465
Ontario Oblique pottery, 98, 101-2, 114, 127, 465
Orange County Chapter of the New York State Archeological Association, 328
Orient Fishtail projectile points, 10, 36, 88, 90, 92, 94, 122-3, 163, 175-6, 178, 180, 188-90, 196, 203, 207, 209, 218, 222, 228-9, 233, 261, 264, 284, 286, 288-9, 293-4, 298, 304, 306, 309, 311, 324, 335, 350, 355-8, 361, 401, 428, 431-3, 447
Orient phase (component), xxvii, 10-2, 15, 17-24, 26, 28, 31-8, 118, 121-3, 161, 163, 170, 179-80, 182, 185, 187-90, 195-6, 203-4, 218-20, 222-3, 235-6, 266, 289, 299, 307, 309, 320, 325, 342, 348, 350-1, 355-62, 364, 397-8, 432-3, 451, 454-5
Orient II site, 29, 34
Osceola projectile points, *see* Otter Creek projectile points
Otstungo Incised pottery, 111, 114, 128-9, 471
Otstungo Incised Variant pottery, 109
Otstungo Notched pottery, 14, 48, 99-102, 111-4, 127, 149, 151-2, 167, 171, 193, 197, 271, 276-7, 279, 315, 318, 320, 382, 468, 471, 474
Otter Creek projectile points, 286, 331, 338, 340-1, 343, 401, 403, 407, 446
Otter Creek-like projectile points, 295, 298, 311, 340, 407
Overpeck Incised pottery, 14, 39, 45-6, 101, 103, 113-4, 130, 167, 171, 194-5, 197, 382, 392, 468, 471-2
Overpeck site, 114, 471
Owasco Phase (component), 16, 29, 39-42, 45-6, 58, 124-5, 127-8, 156, 163-4, 185, 192, 194, 196-7, 203, 216, 220, 223, 227, 257, 266-7, 276-7, 279, 289, 297, 299-300, 310-1, 325, 364, 373, 377, 385-6, 388-90, 392, 397-8, 461, 464-5, 468
Owasco pottery, 16, 39, 46, 58, 111, 127, 149, 151-3, 166-8, 170-7, 193, 201, 205-6, 219, 223, 241, 243-4, 259, 271-2, 297, 299, 305, 315, 323, 374-5, 376-80, 382, 392-3, 442, 451, 460-1, 463-4, 467-8; Collarless, 46; Corded Collar, 14, 44, 46, 149, 151-2, 155, 157, 379-80, 464; Corded

Horizontal, 16, 45-6, 89, 96-7, 100, 111-2, 125, 151, 380, 462; Corded Oblique, 16, 45, 96-7, 112, 125, 265, 381, 462; Corded Punctate, 206, 219, 271-2, 275-7, 293, 297, 299, 462-3; Herringbone, 16, 44-5, 99, 109, 149, 157, 380, 462; Incised Neck, 16, 45; Plain, 16, 45; Platted, 16, 45, 112, 114, 149, 157, 272, 380, 462; Punctate, 271-2, 276-7; Variant, 16, 44, 272

Pahaquarra Copper Mines, 51, 133
Pahaquarra site, xiii, xix, 328, 418, 433, 458, 468, 473, 475
Paleo-Indian phase (component), 220, 237, 239, 330-1
Palmer projectile points, 330
Palmer site, 299
Pardee Place site, xiii
Pennsylvania Land Company, 54
Penobscot Tribe, 299
Pepper, George H., 134, 391
Perkiomen phase (component), 10-3, 17-24, 26, 28, 30-5, 37, 117, 161, 163, 170, 176, 179, 180-2, 185, 187-8, 190, 196, 204, 217-8, 220-2, 235, 266, 278, 319, 332, 339, 342, 346-55, 358-60, 397-8, 413, 418, 426-7, 447, 449
Perkiomen projectile points, 10, 12, 121, 146, 163, 175-6, 180, 187-8, 196, 204, 209-12, 217, 221, 261, 264, 266, 273, 278-9, 284, 286, 289, 304, 311, 316, 318-9, 335, 344, 346, 348, 350, 352, 401, 426-9, 432, 447
Peters-Albrecht (36-Pi-22) site, xiii, 301-11, 320, 355, 372, 377, 389-90, 431, 433, 454-9, 464, 467, 475
Peters-Albrecht (36-pi-22) site, xiii, xvii, 278, 313-20, 345, 349-52, 358, 374, 389-90, 425, 467, 470-1, 475
Peters site, xiii, 470
Peterson site, 366, 370-1, 437
Philhower, Charles A., xviii, 134, 373, 450
Piedmont tradition, 337, 339, 341-3, 367, 408, 446
Piffard site, 121, 427
Plainware pottery, *see* Late Woodland Plainware pottery
Plainview projectile points, 330
Plano-like projectile points, 330
Platted Punctate pottery, 91, 99, 102, 380
Plumsted, Bartholomew and Clement, 54
Point Peninsula phase (component), 124, 369, 372, 450
Point Peninsula pottery, 14, 38, 320, 372, 392, 439, 451, 453, 458-9, 468; Corded, 88, 91-2, 124, 372; Rocker-Stamped, 272, 305, 311, 459
Point Peninsula projectile points, 96
Pope's Creek Net-Marked pottery, 456
Poplar Island projectile points, 337
Poplar Island site, 342
Poplar Neck Rock Shelter, 419
Poxino Island Green Shale, 71
Pratt site, 366, 368, 370-1, 437
Price site, xiii

Raccoon Creek site, 35
Raccoon Notched projectile points, 304, 306, 311
Racoon Point site, 37, 451
Raddatz projectile points, *see* Otter Creek projectile points
Rappahannock Fabric-Impressed pottery, 457
Rappahannock Ware pottery, 472
Red Ochre complex, 121
Regensberg, Richard, 349
Riggins Fabric-Impressed pottery, 457
Ritchie, William A., 12, 28, 30, 32-4, 36, 49, 116, 135, 157, 192, 363, 373, 425, 431, 435, 445
River phase (component), 342
Robbins projectile points, 443
Rochester Junction site, 391
Rohr Shelter, 404, 420
Rosenkrans boatstone, 364
Rosenkrans sites, xiii, xviii, 363-4, 369, 445, 449, 460, 470, 475
Rossville projectile points, 19, 31, 38, 88, 92, 94, 96, 123, 163, 172, 174-5, 177-8, 191-3, 197, 206, 219, 261, 264, 266, 278-9, 304, 316, 318, 320, 364-8, 370, 401, 434-7, 447
Ruppert Island site, 429
Ruttenber, Edward M., 133

Sackett Corded pottery, 5, 16, 44-5, 97, 99, 102, 111, 127, 151, 153, 155, 206, 219, 259, 293, 297, 299, 379, 380-1, 390, 462
Sackett site, 125, 381, 461-2
Saint Albans projectile points, 331, 422
Saint Albans site, 330-2, 422
Saint Christopher site, xiii
Salisbury site, 117
Salwen, Bert, 368
Sandmeyer site, xv
Santos site, xv
Savannah River phase (component), 31, 116
Savannah River Stemmed projectile points 30, 116, 345, 349, 354, 425-6

Savannah River-like projectile points, 349, 353, 447
Savich Farm site, 349
Scaccia site, 361
Scherf River Field sites, xiii
Schneider site, xv, xix, 405, 411, 417, 433
Schrabisch, Max, xiii, 383-4
Schultz Incised pottery, *see* Susquehannock Schultz Incised pottery
Scottsbluff projectile points, 330
Scraped pottery, 259
Seaman site, 416
Seldon Island Cord-Marked pottery, 360
Seneca tradition, 388, 391
Seneca sites, 391
Shawnee Island site, xiii
Sheep Rock Shelter site, 330-1, 334, 340, 404, 422, 455
Shively, Arthur W., xvii
Shohola Creek Shelter, 383
Shriver Expanded Stem projectile point, 335, 419-21, 440, 446
Silverwater-Eilenberger site, xiii
Sindermann, Carl J., 250
Small Corner-Removed projectile points, 284, 288, 295, 298, 345
Smith, Ira F., 454
Snell, James P., 133
Snell site, 461
Snook Kill phase (component), 13, 20, 116, 347-9, 352, 354, 425-6
Snook Kill projectile points, 13, 30, 349, 352
Soapstone vessels, 10, 12, 16-8, 21, 32-8, 55, 65, 75, 80, 82-7, 116-22, 170-1, 187-8, 190, 196, 218, 264, 266, 287-9, 346, 351-8, 360, 425, 429, 433, 449, 451
Society for Pennsylvania Archaeology, xii, xiii, xv, xviii, 55, 393
Somerville, Maxwell, xviii, 134
Squawkie Hill phase (component), 369
Squibnocket Stemmed projectile points, 337
Squibnocket tradition, 342
Squibnocket triangle project points, 439
Staats, F. Dayton, 2, 3, 7, 33, 48-9, 51, 53-4, 330, 373
Stanley projectile points, 330
Starr projectile points, 439
Steubenville Stemmed projectile points, 367, 437, 444-5
Stony Brook site, 78, 360
Stony Creek Cord-Marked pottery, 360, 364
Strickler site, 391
Sugar Loaf site, 12, 35
Susquehanna Broadspear projectile points 63, 69, 71, 74, 76, 117, 121, 175, 180, 187, 204, 209-10, 217, 221, 345-8, 350, 353-4, 401, 411, 427-9, 431, 447
Susquehanna phase (component), xxvii, 11-2, 17, 19-20, 36, 59, 65, 69, 78, 85, 116-8, 121-2, 346-7, 350-1, 353-5, 429-30
Susquehanna sites, 63
Susquehannock pottery, 388, 391-2, 474; Shultz Incised, 45-6, 110, 129, 157, 389, 392, 474; Susquehannock-Wyoming Valley, 474-5
Susquehannock sites, 53
Susquehannock traits, 39, 475
Susquehannock tulip bowl pipe, 392
Sylvan Lake Rock Shelter, 328, 331, 340-1, 407, 413, 417
Sylvan Lake Side-Notched projectile points, 337
Sylvan Lake tradition, 342
Symonds, Jane, 54

Taconic tradition, 335, 337, 342
Talco projectile points, 439
Ten Owners site, xiii
Theune site, xiii
Titicut site, 422, 432
Tocks Island Reservoir, xix, xx, 55, 131, 182, 199, 235, 253, 292, 327-9
Tocks Island site, 454
Toms Creek, 225, 227
Tortugas projectile points, 439
Toth, Steven J., 3, 5, 14, 36, 132, 334
Townsend Ware pottery, 472
Triassic Lackatong argillite, 30
Tribal phase (component), 163-4, 185, 192, 194-5, 197, 216, 219-20, 223, 227, 257, 266-7, 276-7, 279, 288, 297, 299-300, 311, 317, 364, 373, 375, 377, 385-90, 397-8, 468
Tribal Series pottery, 157, 166-7, 170-1, 193-5, 201, 205-6, 219, 241-4, 252, 259-60, 271-2, 276, 283, 287, 289, 293, 298, 300, 306, 311, 315, 317-8, 374, 376, 378-9, 381-2, 451, 464, 467-8
Trumm site, 37
t'Schichte Wacki, 389
Turney projectile points, 439
Two Creeks Interstadial, 330
Tycop, Indian of Minisink, 134

Unalachtigo Indians, 393
Unami Indians, 393, 471

Valders substage, 330
Van Campen's Cottage sites, xiii, 135, 454, 467
Van der Donck, Adrian, 133, 389, 390
Van Etten site, 390-1
Vancampens Brook, 1, 32-3
Vandercar, Robert, 241
Vergennes complex, 340, 343
Vernon Fishtail projectile points, 432
Vincent site, 84, 348, 366, 368, 370-1, 437
Vinette Dentate pottery, 458
Vinette I pottery, 16, 38, 87, 89, 94, 121-2, 124, 164, 168, 170-1, 193, 197, 205-6, 259, 264, 266, 271, 275-6, 305, 310, 356-7, 360, 362, 365-8, 371, 433, 453-4
Vinette site, 362
Von Hagen sites, xiii
Vosburg phase (component), 340 343, 397-8
Vosburg projectile points, 21, 29, 146, 295, 298, 304, 316, 319, 334-5, 338-41, 401-3, 405, 418, 446

Wabanaki Tribe, 299
Wachenfeld site, xiii
Wading River projectile points, 123, 337
Wading River tradition, 342
Wagoner Incised pottery, 99, 103, 128
Walter Franke Collection, *see* Franke Collection
Walter site, xiii
Ware Plain pottery, 16, 38
Ware site, 16, 451
Washington Boro Incised pottery, 474
Watertown phase (component), 116, 122, 348, 350-1, 355, 359-60, 429
Wayland Notched/Susquehanna Broad projectile points, 116, 122, 348, 429
Webb phase (component), 372, 438
Weir site, 30, 352
Wells site, 460
Werner, David J., xix, 23, 354, 357, 372-4, 376-7, 401, 414-5, 418, 430, 445, 474
White, John, 297, 323
Wickham Corded punctate pottery, 16, 380, 461
Windsor tradition, 368
Wiped pottery, 87, 89, 92, 164, 170-1, 193, 197, 259, 293, 297, 365-6, 368, 371, 456-7
Witthoft, John, 33, 116, 345, 383
Wolf site, xv
Workshop site, xiii
Wyoming Historical and Geological Society, 321

Zeisberger, David, 133
Zierdt site, xv, xix, 327-9, 331-2, 342, 404-5, 408, 411, 415, 417-8, 420, 423, 425, 427, 433, 439, 445, 449
Zimmermann Corded pottery, 94
Zimmermann Platted Punctate pottery, 114, 466
Zimmermann sites, xiii, xv, xix, xxi, 55-130, 182, 309, 332, 336, 343, 348, 350-1, 354-5, 357-8, 362, 364, 372-5, 377, 380, 388, 391, 401, 411, 427, 430-3, 435, 438-9, 442, 454-5, 457-68, 470-7, 474-5
Zipser sites, xiii, 464, 470

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